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PC HOW-TO GUIDE

SPECIAL ISSUE • WINTER 2005

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- Build and secure a wireless network
- Eradicate pop-ups and spyware
- Protect your digital identity
- Make a killer home movie with WinXP
- Overclock your videocard
- Build a media center PC

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The best WinXP secrets that you need to know!

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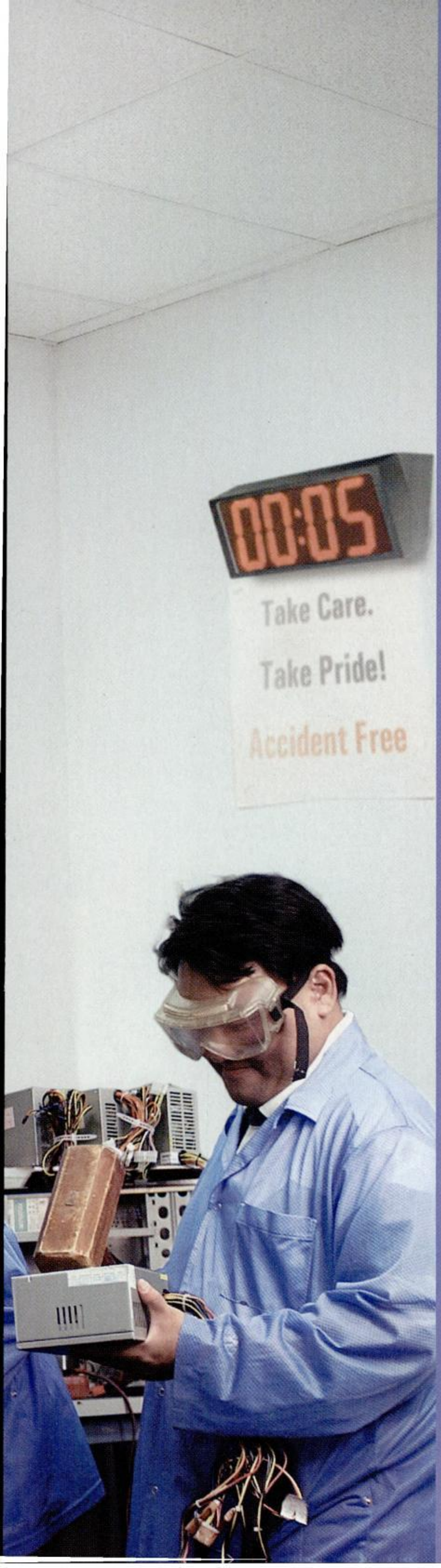

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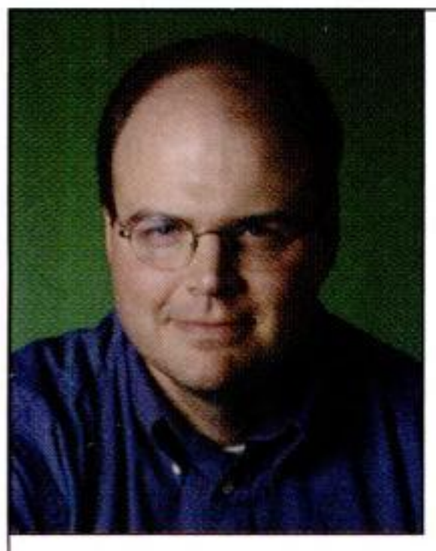

Release Notes

Make Your PC's Tires Squeal

Corvettes look nice, but if you never get them out of 3rd gear, what's the point of owning one—right? Right.

Maximum PC's crack Lab staff weeps painful tears when we see someone using their brand-new 3.8GHz P4 PC—tweaked out with oodles of RAM, fat and fast hard drives, and a screaming videocard—for basic email and web-related tasks. Add gaming (no, *Minesweeper* and *Tetris* don't count) to this list and we'll gain a little more respect for you. But you're still barely scratching the surface, bub.

We are decent, law-abiding citizens, but we also realize that every now and then, you simply have to take that 'Vette out of the garage and wind it out a bit. That's why you bought it, after all. If you don't own a Corvette, hey, no problem—I'm really talking about your PC. And *that* is something you can push to the limits every day, without risk of being fined and/or imprisoned. What's more, in the process, you can open up new avenues of personal creativity you never thought possible.

In your hands you hold the keys to unlocking every ounce of horsepower idling in the silicon-powered 'Vette you have parked under your desk. We're going to show you how to use your PC in exciting new ways. Follow our lead, and in no time at all you'll be taking pro-caliber digital photos, transforming your old system into a top-notch media server, installing the latest and greatest RAID technology, and ripping the crispest MP3 CD and DVD audio tracks you've ever heard.

And, if you've ever toyed with the idea of dabbling in making your own movies—this issue is for you. Windows XP includes an excellent enthusiast-level video-editing toolset, *Movie Maker 2*, and we've tapped none other than expert and author John "PapaJohn" Buechler to show you how to use it to produce a complex, polished, and entertaining home movie. All the files you need to follow along with this story and perform every step are on the CD that came with this issue.

What about wireless? We've got that covered, too, starting with a complete walkthrough on how to set up a perfect wireless network. Then we show you how to secure and use your new Wi-Fi in ways you may not have considered.

So what are you waiting for? It's time to put the pedal to the metal and the rubber to the road. There's a lot of power under the hood of your PC; let us show you how to harness it.

—Stephen P. Klett Jr.
sklett@maximumpc.com

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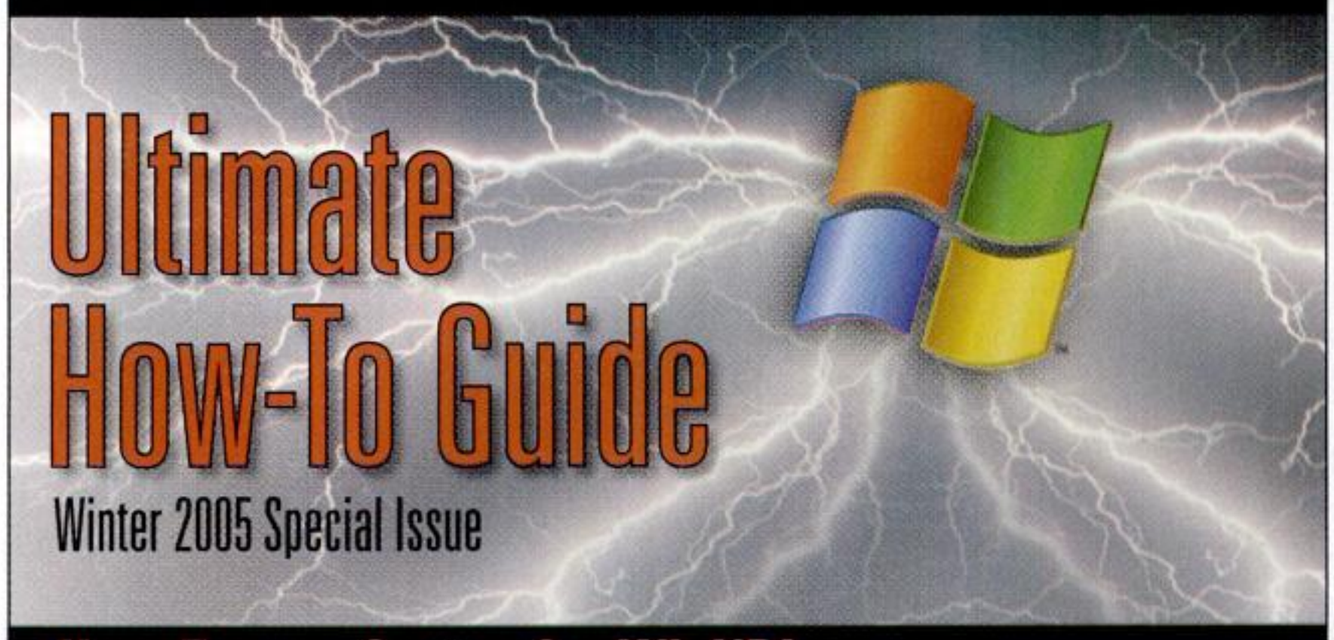

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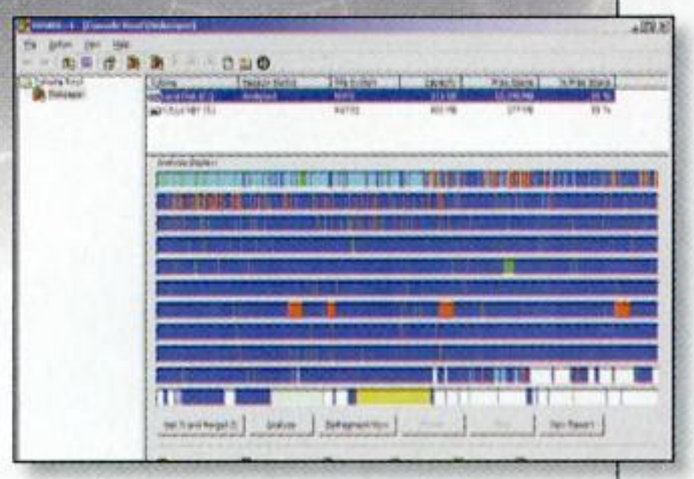

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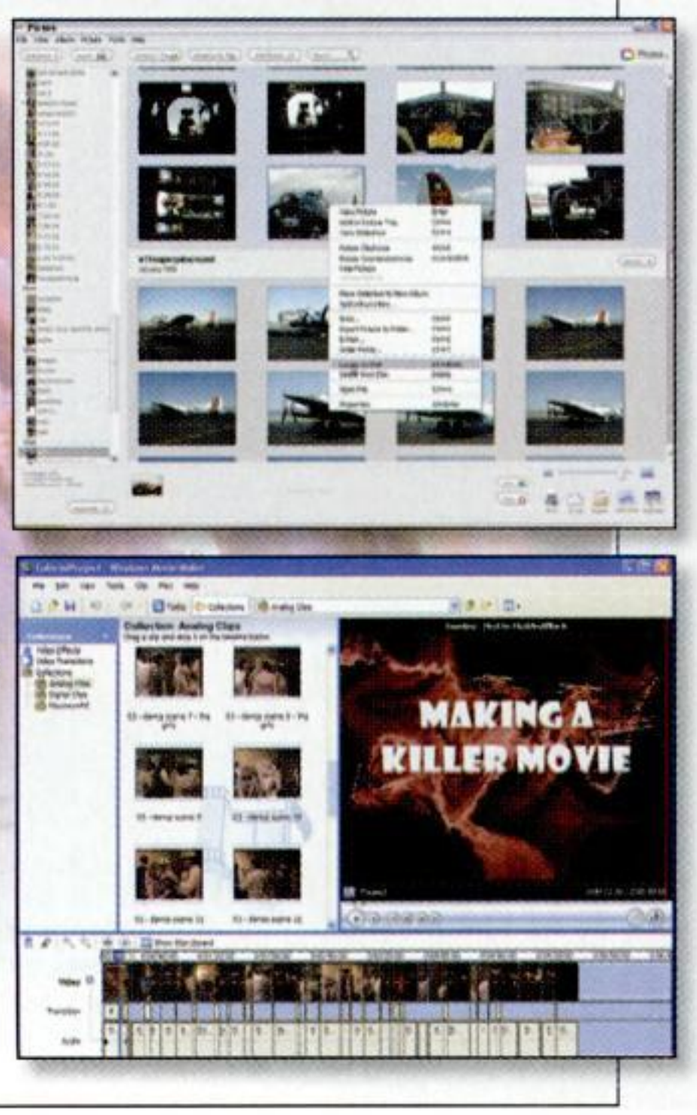

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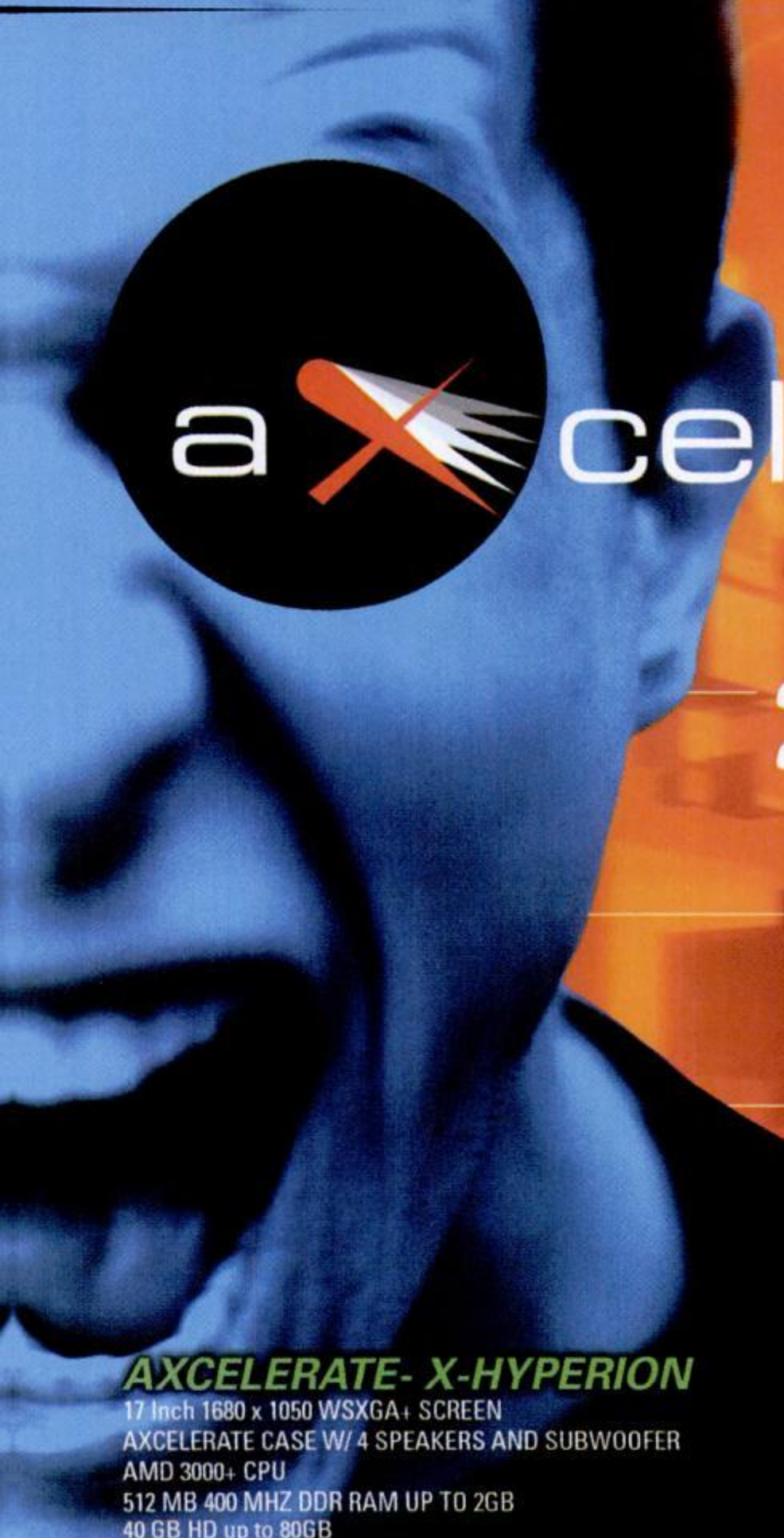

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Ultimate How-To Guide

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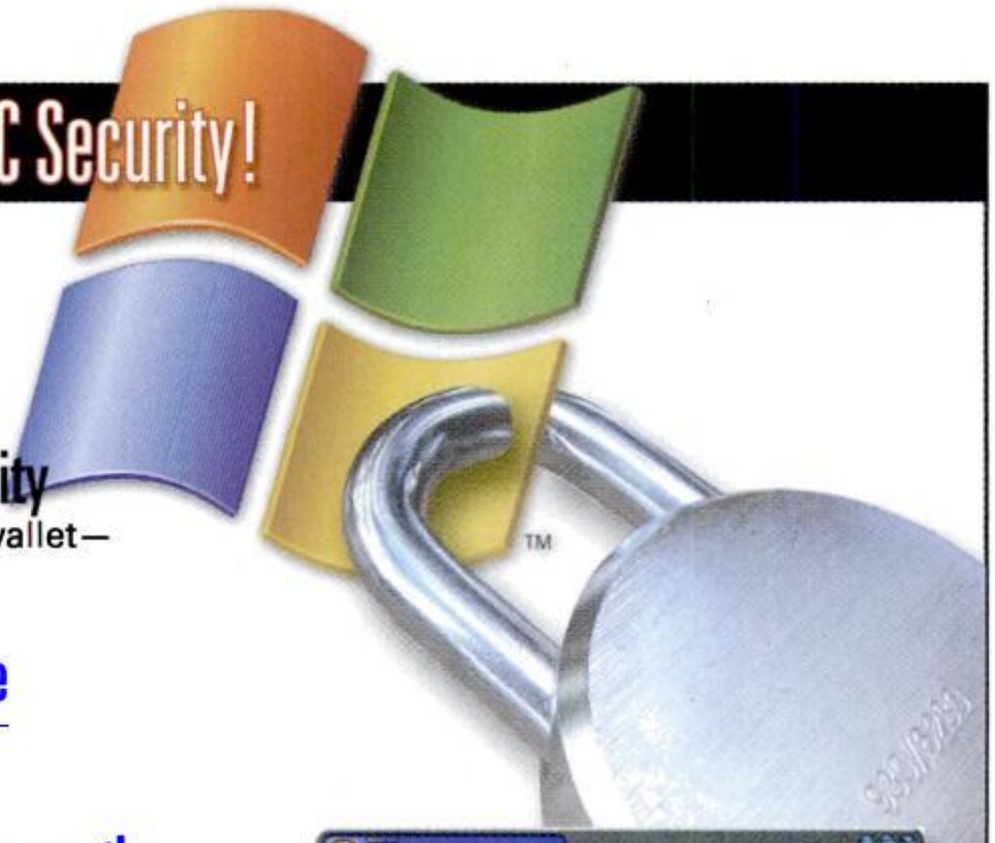

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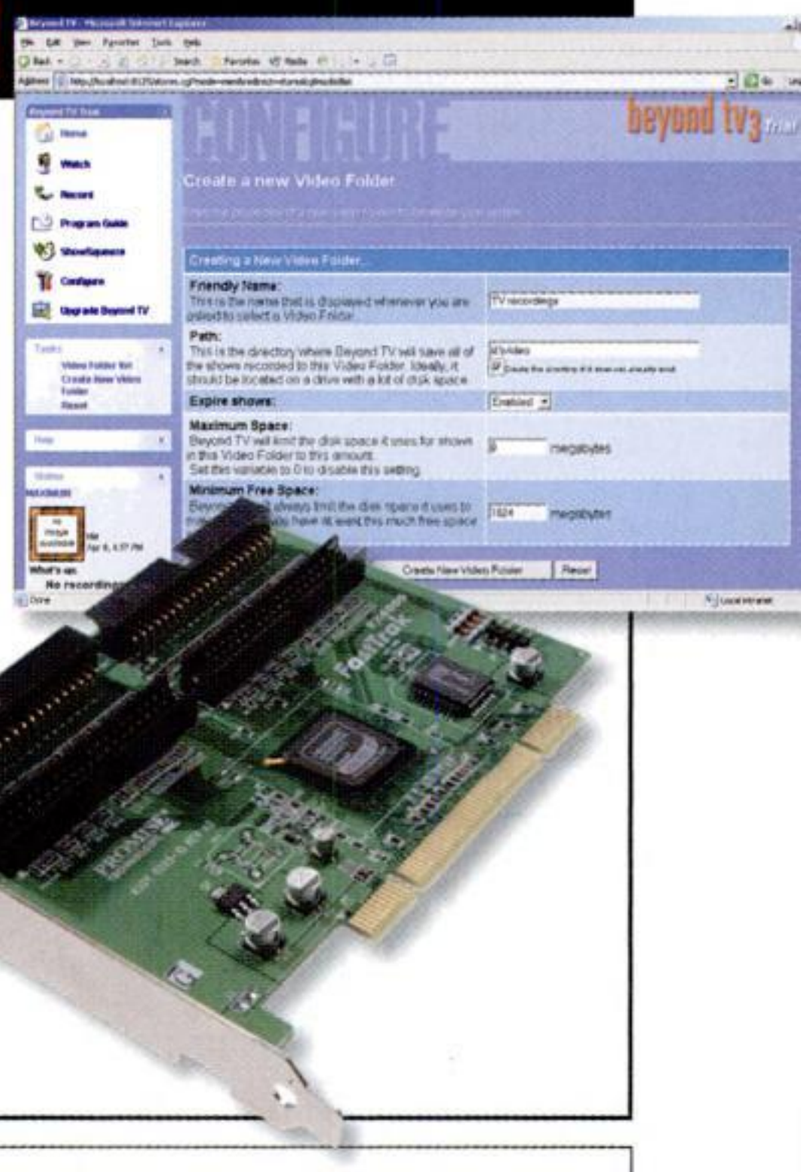

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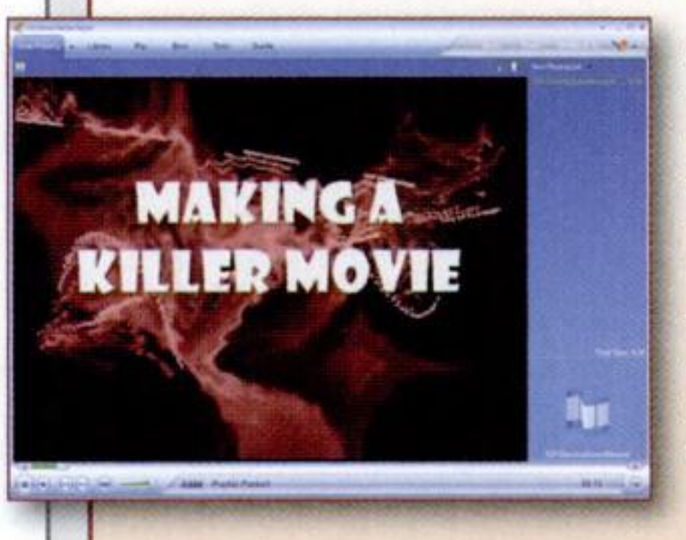
ON THE CD

1 KILLER game, 5 AWESOME apps, and 7 INCREDIBLY Useful Utilities

Windows XP Movie Maker Tutorial

In ultimate *Maximum PC* "How To" style, we bring you an interactive tutorial on how to make an awesome home movie—one friends and family will actually *want* to watch. If you're using WinXP, you've already got the software tools you need, *Movie Maker 2* is included with this version of Windows. Noted *Movie Maker 2* expert John "PapaJohn" Buechler steps you through how to use it, in intricate detail, on page 30. And you'll find a zip file on the CD packed with nearly 200MB of files you can use to follow along with PapaJohn's story and take your first step toward mastering *Movie Maker 2* today!



Note: PapaJohn used *Movie Maker 2.1*, which is included with Windows XP Service Pack 2, to create the movie and files used for this story. For the best compatibility, it is recommended that you use the same version. So, if you haven't upgraded to SP2 yet, now might be the time. And if you need more reasons to do so, check out SP2's new security features on page 42.

To download the *Movie Maker 2* tutorial files to your PC, go to the "Apps" menu on the CD, select "Making a movie How-to," and choose Install. At right is a complete list of all the files and what they are used for.

Two versions of the finished movie to view in Windows Media Player:

- *DancinQueen-WeddingSite.wmv*, which is the original version of the movie PapaJohn made for the newlyweds.
- *MaximumPC.wmv*, which is a Special Edition created for this tutorial

Three video/audio source files from the event:

AnalogCamcorderFootage.wmv
DigitalCamcorderFootage.wmv
AudioTrack.wma

Four source clips from the stock library:

These are the same ones PapaJohn used to make the Special Edition:

RedToRedAndBlack.wmv
GreenAndWhiteFireworks.wmv
AudioForFireworks.wma
Blackness.jpg

Three *Movie Maker 2* working files:

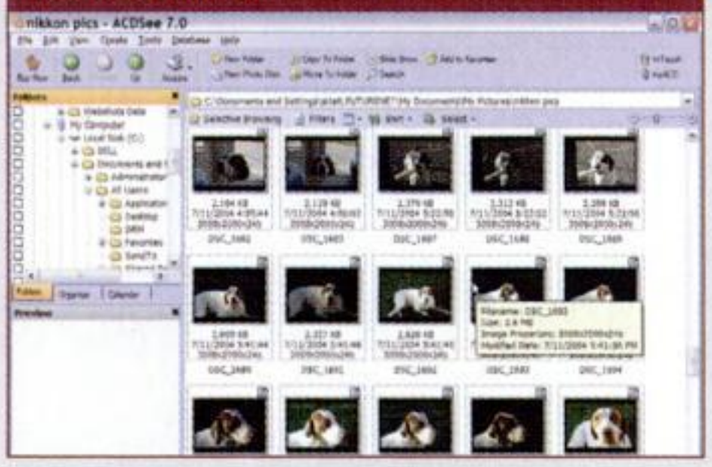
Includes the collection database used to create the tutorial version, and two versions of the project file representing the final two used to render the two movies. These files are not needed for the tutorial: They are included for study purposes only, and are for people using *Movie Maker 2.1*. Their file names are:

MEDIATAB1.DAT (the collection database)
WeddingSiteVersion.MSWMM
TutorialProject.MSWMM

For more tips and advice on how to use Movie Maker 2, hit up PapaJohn's Web site at www.papajohn.org.

APPLICATIONS

ACDSee 7.0 Trial



ACDSee 7.0 Trial

This all-in-one digital image manager is one of the best ever made. It makes viewing, finding, organizing, and printing your digital pictures a walk in the park, and is the fastest way to flip through folders full of images. Give it a try, and you'll wonder how you survived without it.

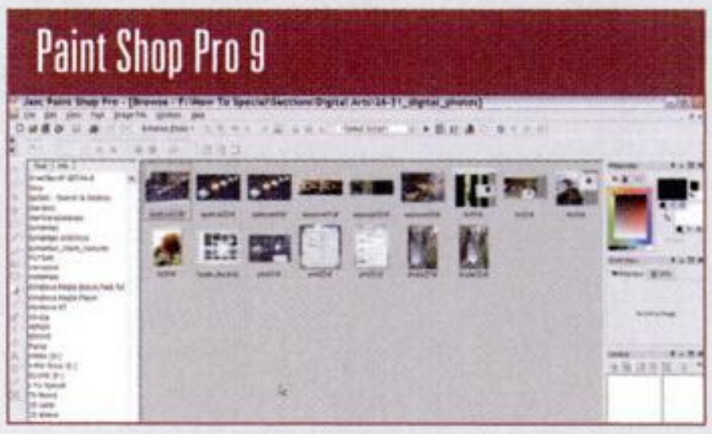
Paint Shop Pro 9

This digital image-editing software does everything you could possibly dream of. It lets you resize images, correct the colors, add special effects and filters, and more. It's one of the most popular editing apps out there for a reason—judge for yourself!

Photo Album 5 Trial

This digital image viewing and organizing software gives you the power to catalog your images any way you want. Not only is it easy to use, it's also lightning-fast, no matter how big your image collection may be. You can even choose a naming system that can be used to organize all the photos, automatically. The options are almost endless to what you can do with this software.

Paint Shop Pro 9



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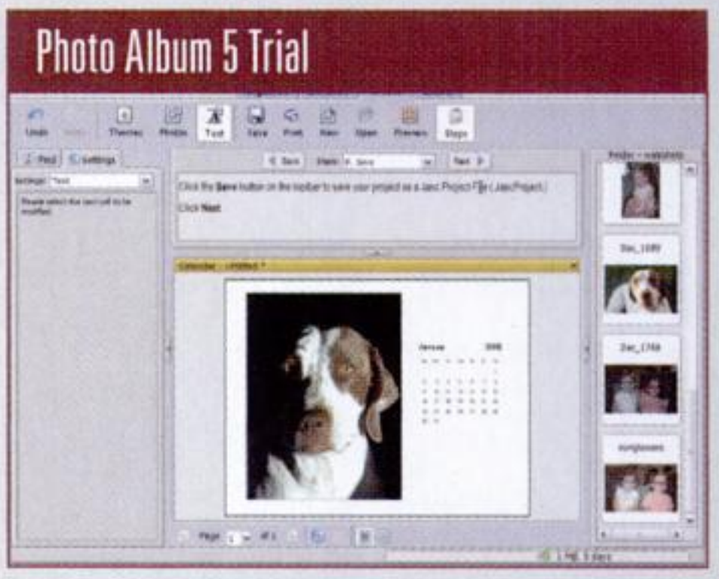

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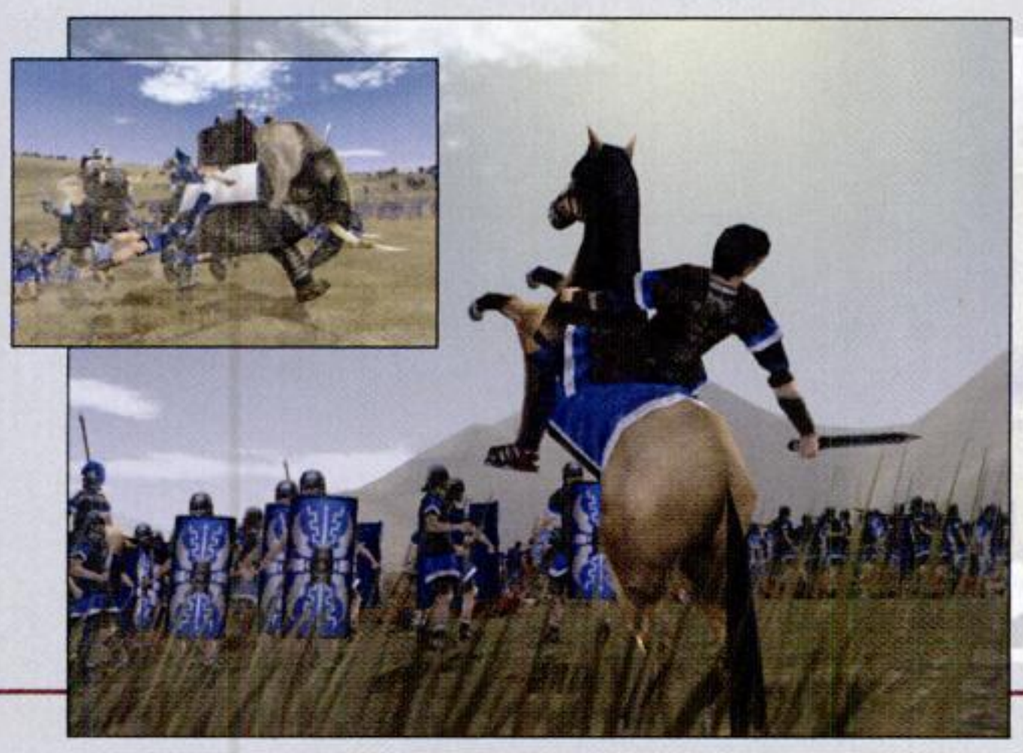


ROME: TOTAL WAR

All work and no play makes Jack a dull boy—and Jill a dull girl. So we've included one especially addictive game demo on the CD to give you a bit of a breather. *Rome: Total War* is quite simply the best real-time strategy game to hit our desks in many moons, and it is well worth checking out. This 162MB demo includes an excellent tutorial and the complete "Battle of Trebia" mission. For its historical accuracy, remarkable level of detail, and stupendous graphics, the *Rome: Total War* game engine is even being used by the History Channel to illustrate its show Decisive Battles. What are you waiting for? Load it up and see what all the fuss is about!

Ulead PhotoImpact 10 Trial

This is a complete photo-editing suite that is good for beginners and advanced users alike, offering both powerful tools and simple operation. For example; there's a new Basic Mode for those new to the sport of editing digital pics, and enhanced capabilities for handling the larger file sizes of today's new high-resolution digital cameras.

Picasa 1.6

Don't let the small file size fool you: This image-viewing app is not only great, it's free to boot, courtesy of Google. It lets you search your pic database quickly and easily, linking you directly to individual photos on your hard drive. Plus, it automatically downloads images from your digital camera, and allows you to create slideshows to share with your friends. Check it out!

UTILITIES

Ad-aware SE Personal

Lay the smack down on spyware with *Ad-aware*—the most popular spyware utility on the market. It's regularly updated to detect new threats to your PC, and regular use can go a long ways toward keeping your system performing at maximum efficiency.

AntiVir Personal Edition

This free antivirus utility is one of the best around, and it can detect and remove more than 80,000 known viruses. It includes an internet update wizard to keep your PC protected at all times, and it also protects against master boot-record viruses!

Steganos Security Suite 7.05 Trial

If you're afraid of prying eyes, the *Steganos Security Suite* offers a huge range of useful tools that allow you to easily protect your data. You can use it to conceal data inside images, encrypt emails, shred data, wipe your hard drives, and more. This security suite really does it all.

DriveScrubber Trial

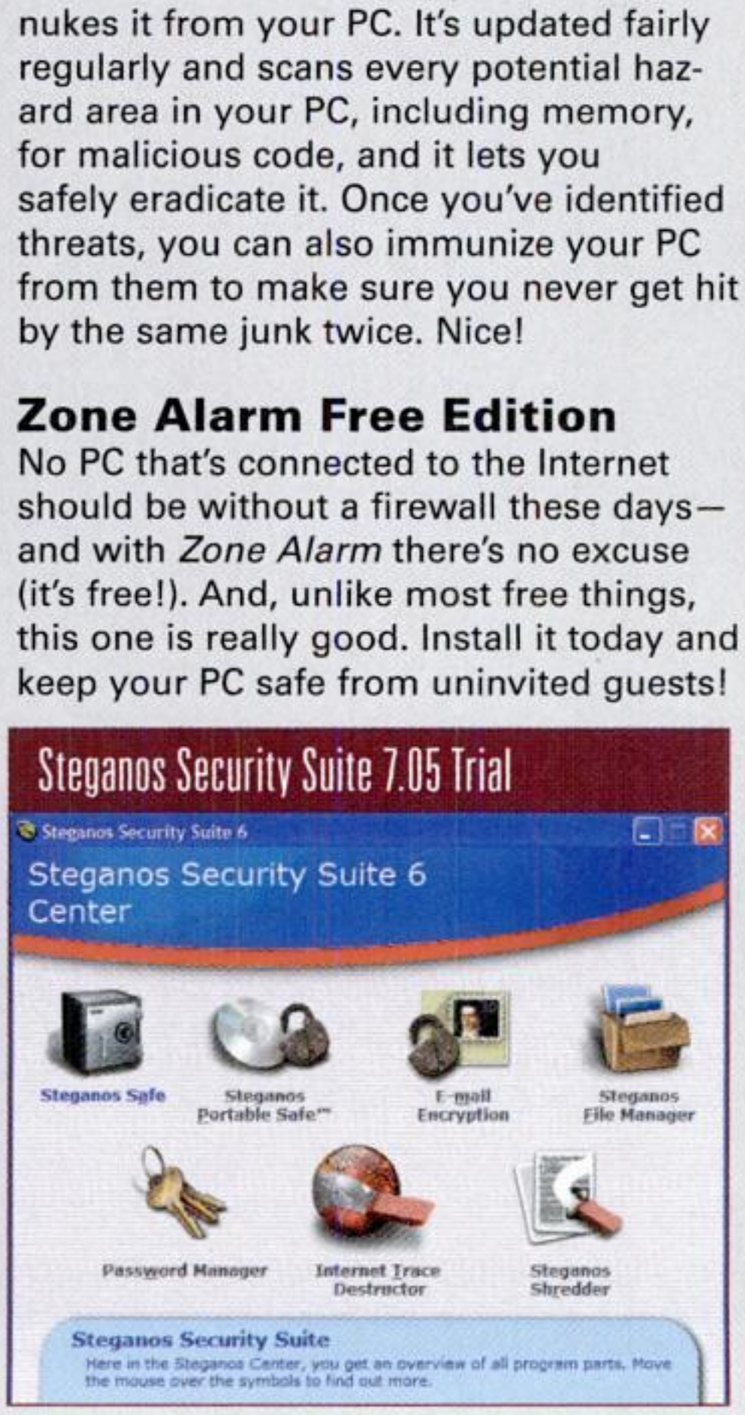
If you're thinking about selling a computer and don't want the data on your hard drive to fall into the wrong hands, *DriveScrubber* has come to the rescue! Once a drive has been "scrubbed" with this utility, it is literally and physically impossible to retrieve the contents that used to be on the drive (as opposed to just deleting everything in Windows, which leaves the content intact).

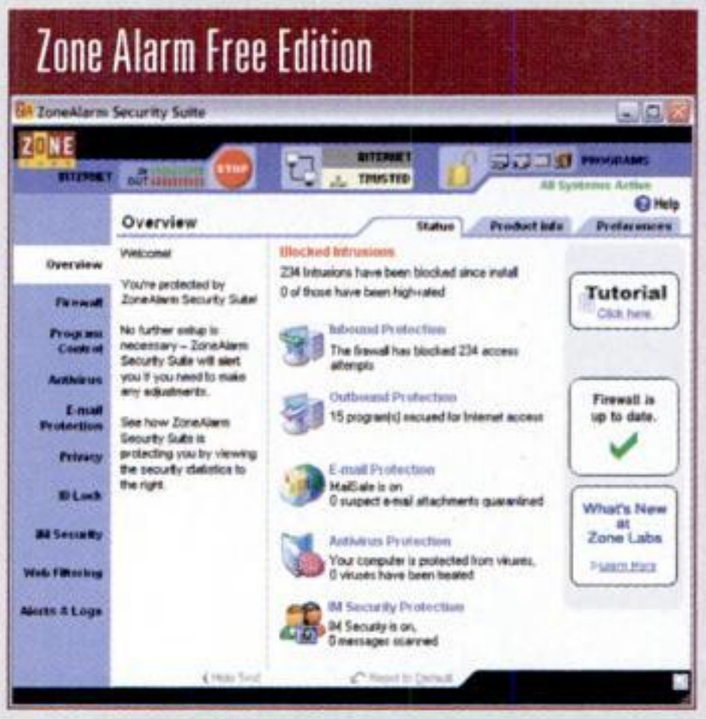
Spybot Search & Destroy

Spybot Search and Destroy is aptly named, as it roots out spyware and nukes it from your PC. It's updated fairly regularly and scans every potential hazard area in your PC, including memory, for malicious code, and it lets you safely eradicate it. Once you've identified threats, you can also immunize your PC from them to make sure you never get hit by the same junk twice. Nice!

Zone Alarm Free Edition

No PC that's connected to the Internet should be without a firewall these days—and with *Zone Alarm* there's no excuse (it's free!). And, unlike most free things, this one is really good. Install it today and keep your PC safe from uninvited guests!





WinZip

WinZip is the most ubiquitous file-compression utility around, and no PC should be without it. You can also use it to unzip the *Movie Maker 2* tutorial files on this very CD.

EXTRAS

It's just what you always wanted: your very own *Maximum PC* screensaver! Install it and then sit back and behold the wonder and joy it brings!

Disc Issues?

If you should happen to have problems using the CD, here are a few things you can try:

- Open "My Computer"
- Right-click the drive that contains the Maximum PC CD
- Select "Explore"
- Double-click the pink icon labled Maxpc.exe

The disc interface should open. If this doesn't work, try updating your Flash player at www.macromedia.com. Still stuck? Got Questions or Comments? E-mail: Dischelp@maximumpc.com

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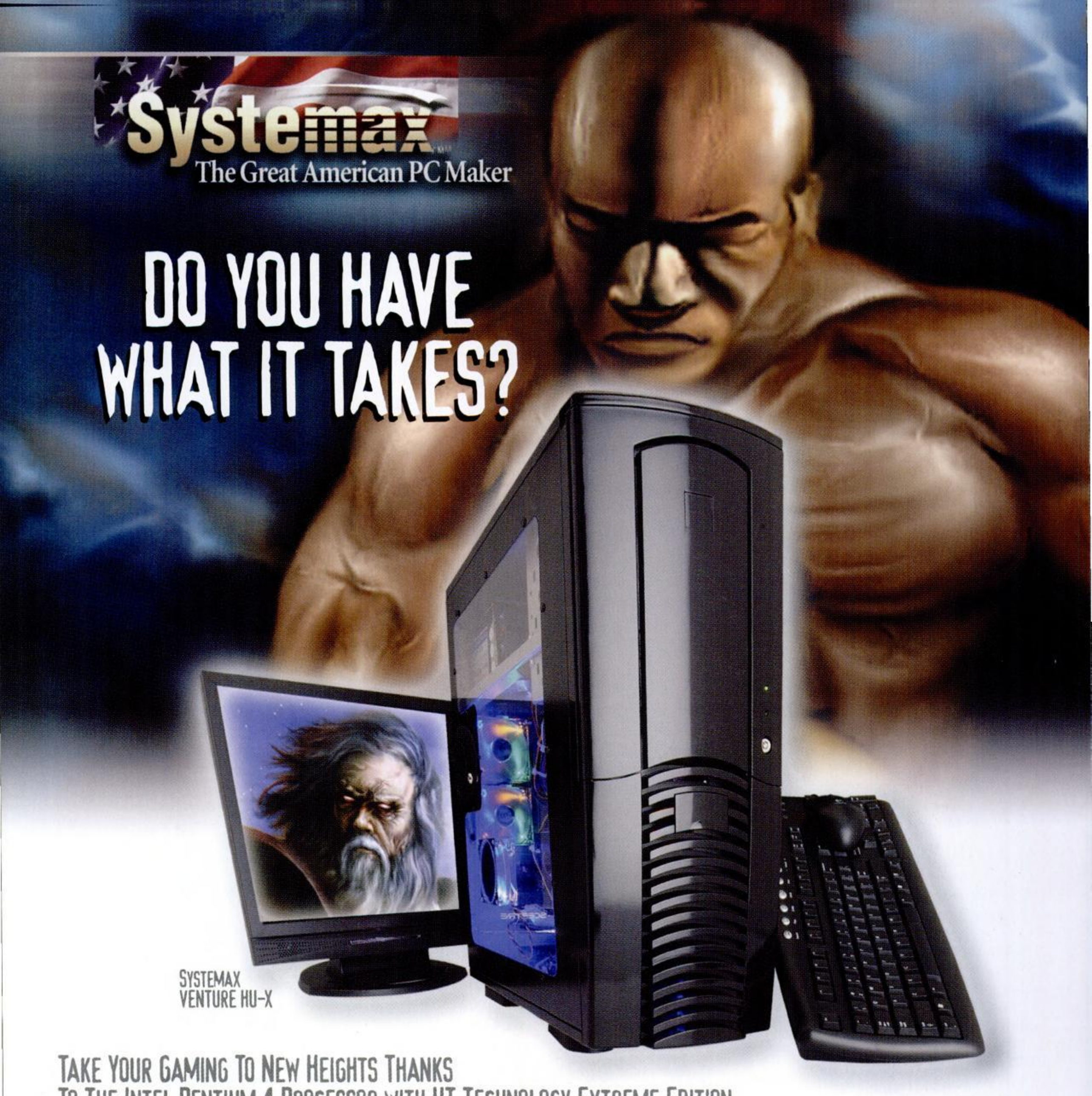

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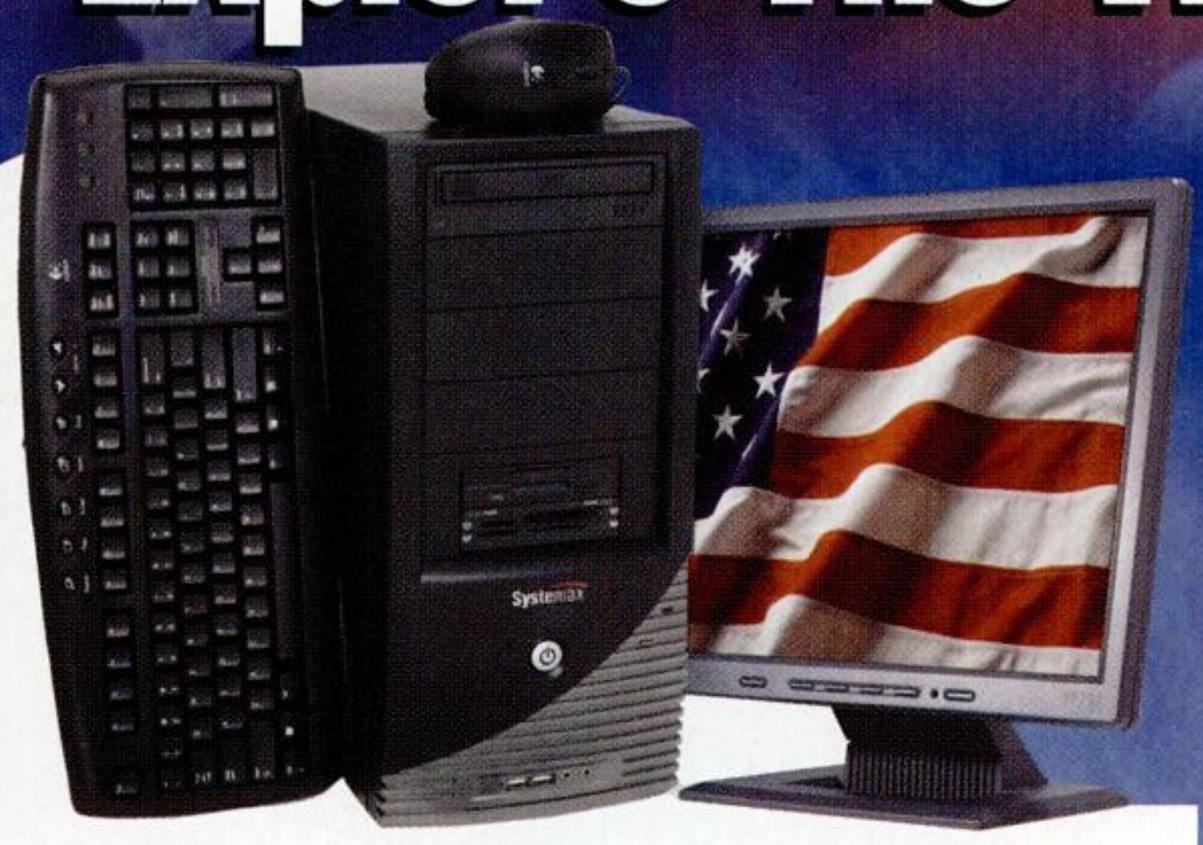

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How To...

A step-by-step guide to tweaking your PC Experience ™

TURBOCHARGE Windows XP

41 top-secret tips and tricks that will turn even a puny PC into a powerhouse

Accelerate Windows

Get the latest drivers

There's a reason we mention this every time we dole out Windows tips: It should always be your starting point. Getting the latest drivers for your hardware can give you a big performance boost and make your PC more stable at the same time. You don't need to update drivers for all the hardware in your machine, just the crucial components. We recommend you update your videocard, motherboard chipset, and soundcard drivers

5 SOFTWARE TOOLS EVERY PC SHOULD HAVE

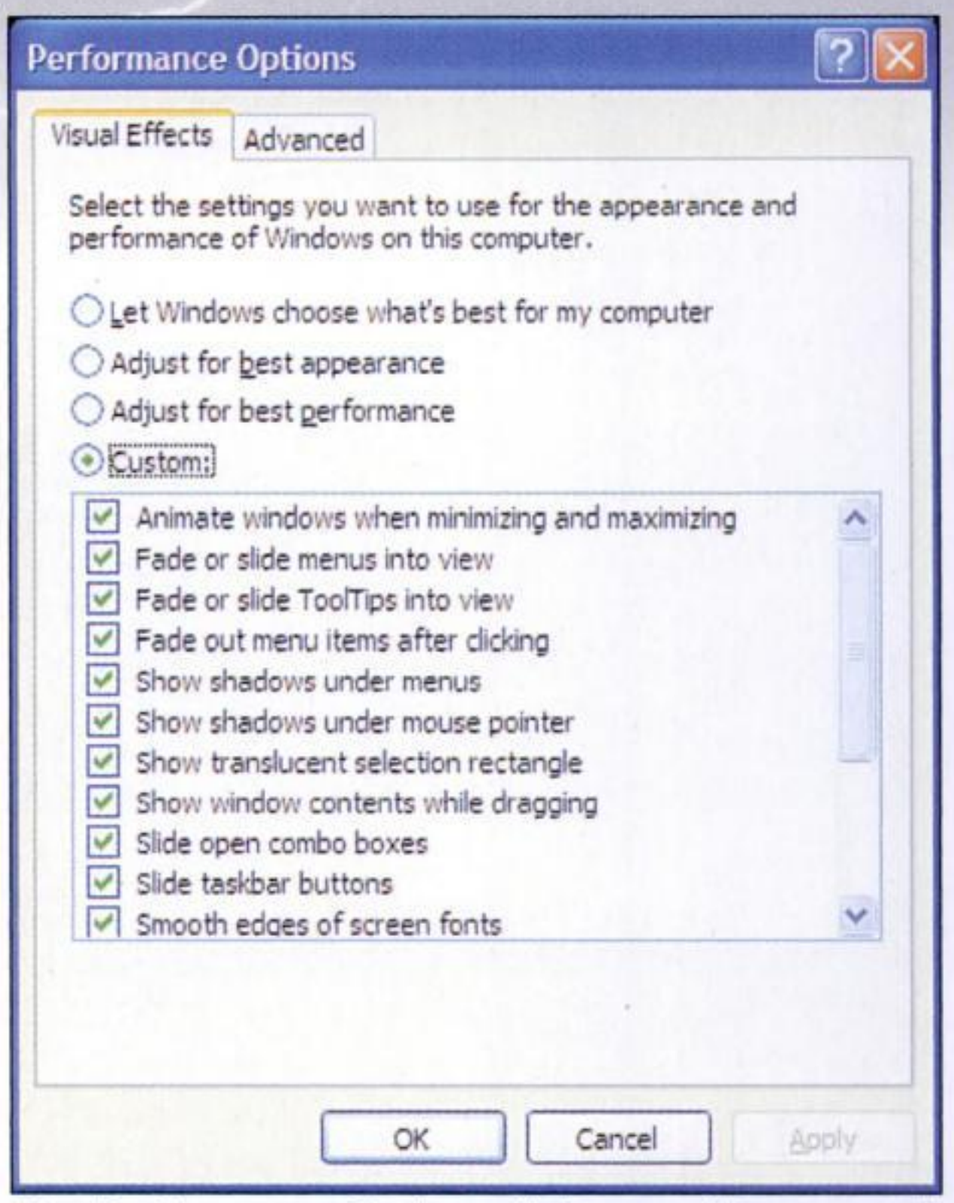
1 Compression utilities: *WinZip* is the best utility around for managing pesky zip files. You don't have to settle for the puny Compressed Files tool built into XP anymore! Get it at winzip.com.

2 Antivirus: In today's dog-eat-dog Internet world, you must have antivirus software. We recommend *Norton AntiVirus 2004* (www.norton.com). It's easy to use and provides excellent protection.

3 Firewall: Running a PC without a firewall is like using a blood-based sunscreen in shark-infested waters. We recommend *Zone Alarm* (www.zonelabs.com).

4 Browser: Only schmucks are still using *Internet Explorer.* Download Mozilla *Firefox 0.8* (www.mozilla.org) and browse with the power users.

5 Defrag: The hard drive defragging utility built into Windows XP is acceptable for your grandmother, but if you want to keep your disks in tip-top shape, you need a more powerful tool. Get Diskeeper from www.executivesoftware.com.



The Performance Options dialog provides several options for the performance-conscious. You can either disable all the fancy-schmancy interface options that Windows XP added, or pick and choose the features you'll sacrifice.

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regularly, but drivers for your mouse, keyboard, and other USB devices need to be updated only when you experience problems.

Disable Windows' bells and whistles

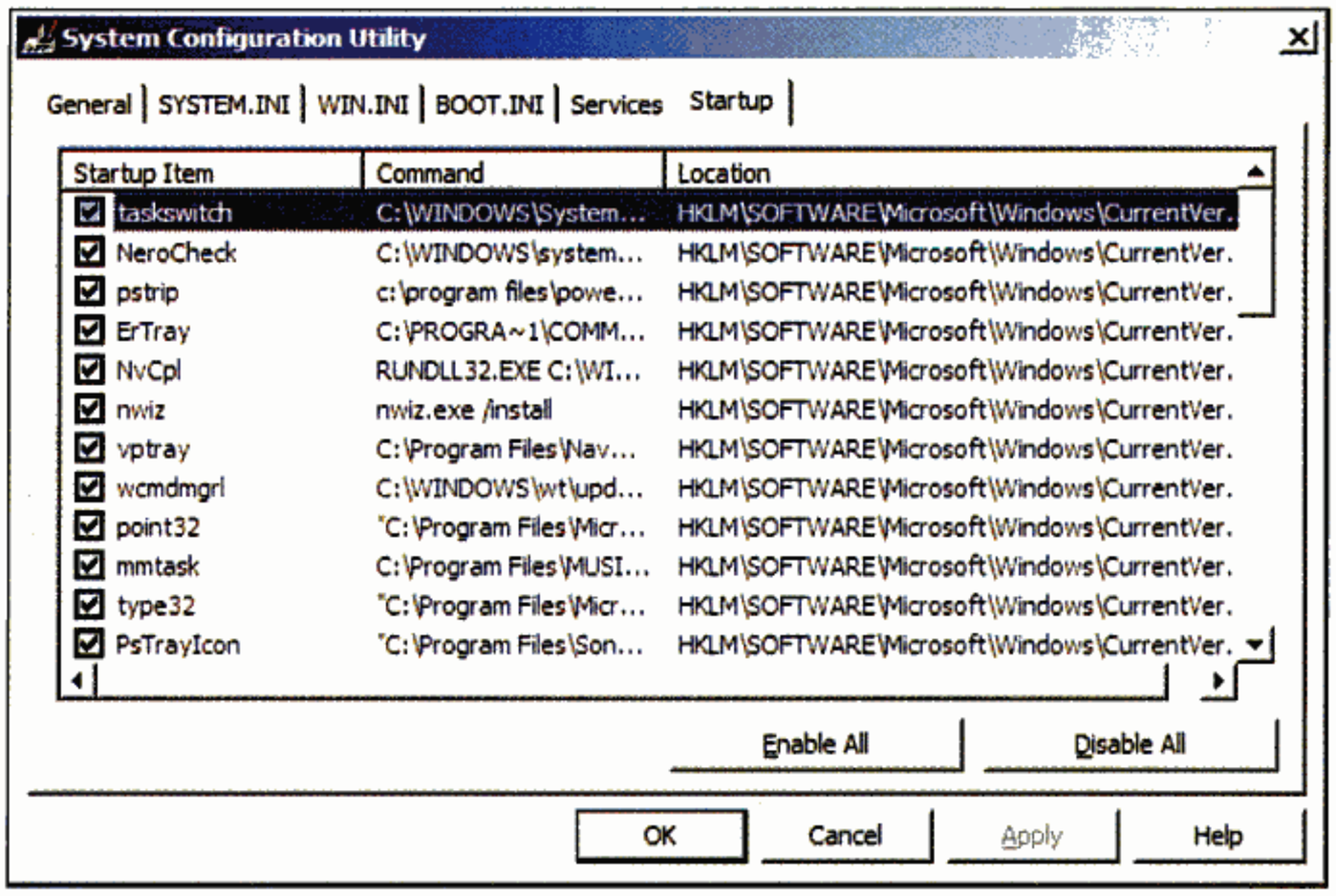
Windows XP is the best-looking OS from Microsoft to date, but those good looks aren't free. The fancy new UI, drop shadows, and other adornments can negatively impact your PC's performance. Luckily, these features are easy to disable.

• First, go to System Properties by pressing the Windows key and Pause/Break. Go to the Advanced tab, and press the Settings button in the Performance section.

• On the Visual Effects tab of the Performance dialog (see image), change the setting to "Adjust for best performance." You can also pick and choose your settings by using the Custom option if you prefer. When you're done, press OK, and close System Properties.

• Now cruise over to Display Properties by right-clicking an open area of your Desktop and clicking Properties. Go to the Appearance tab, then click Effects. For best performance, make sure all the options here are unchecked.

• Drawing a bunch of icons on your Desktop can impact performance, especially if you have a lot of real estate with a multi-monitor display. If you'd rather take a solid kick to the groin than clean up the unneeded icons, you can sweep them under the rug simply and easily. Just right-click an open area of your Desktop, go to Arrange Icons, and uncheck "Show Desktop Icons." Voilà, your problem is solved!



Msconfig lets you selectively disable startup apps. It's tricky to tell what item goes with what app, though, because of the cryptic names. It might be obvious that NeroCheck has something to do with *Nero* CD burning software, but what's nwiz? The easiest way to find out is to search for the item's name in *Google*. Nine times out of 10, someone on the net has already tracked it down.

Torpedo System Tray apps—keep evil apps from eating your resources

Every frickin' application we install lately seems to dump some sort of craptacular applet into our System Tray. We're so sick of it that we now summarily give these tiny apps the death penalty. Don't worry, it's easy and fun for the whole family!

To kill the apps, you need to root them out at their source. You could visit the Registry, the Startup folder, and the other secret places where software apps hide their auto-starting hell-spawn, but it's easier to use the msconfig tool. To start it, go to Start, Run, and then type msconfig.exe. When the app opens, go to the Startup tab. The vast majority of your evil Systray apps can be disabled from here.

The difficulty lies in figuring out which apps you need, and which you don't. Stretch the command heading far enough to the right so you can see the entire path to the app. Most of the time you'll be able to tell the name or manufacturer of the app by looking at the place where it's saved on your hard

Did You Know?

When you're entering a URL in Internet Explorer that begins with "www" and ends in ".com," all you have to do is enter the domain name itself, like "maximumpc," and press Ctrl-Enter. The "www" and ".com" will be filled in for you, as if by magic.

10 THINGS TO DO TO WITH YOUR BRAND-NEW PC

1 Get your Internet connection up and running. Without net access, your PC is damn near worthless!

2 Install the latest drivers for your motherboard's chipset. They'll be at your mobo manufacturer's Web site. Many system crashes can be traced directly to either old chipset drivers or evil, evil gnomes.

3 Download and install the latest drivers for your videocard and soundcard. They'll work with the chipset drivers to have your PC performing at its peak potential.

4 Install Windows XP Service Pack 2 and all the updates from **Windowsupdate.com**. Don't ask questions, just do it.

5 Restore your precious data to your new machine.

6 Install and tweak all those apps you use every day. Install *WinZip*, an MP3 player, a word processor, your e-mail app, and Mozilla **Firebird**.

7 Activate Windows, register all your apps—or click the "Never bother me again" button—and make a backup image of your minty-fresh system.

8 Install your favorite benchmark app and take your PC for a test spin.

9 Burning in your PC will help ferret out faulty components and give you a pretty good idea of your system's stability. We like *SiSoft Sandra's* burn-in utility. Download the free version at Sisoftware.net.

10 Open a tasty beverage, fire up your favorite game, and let the frags roll in. Your PC is ready to rumble!

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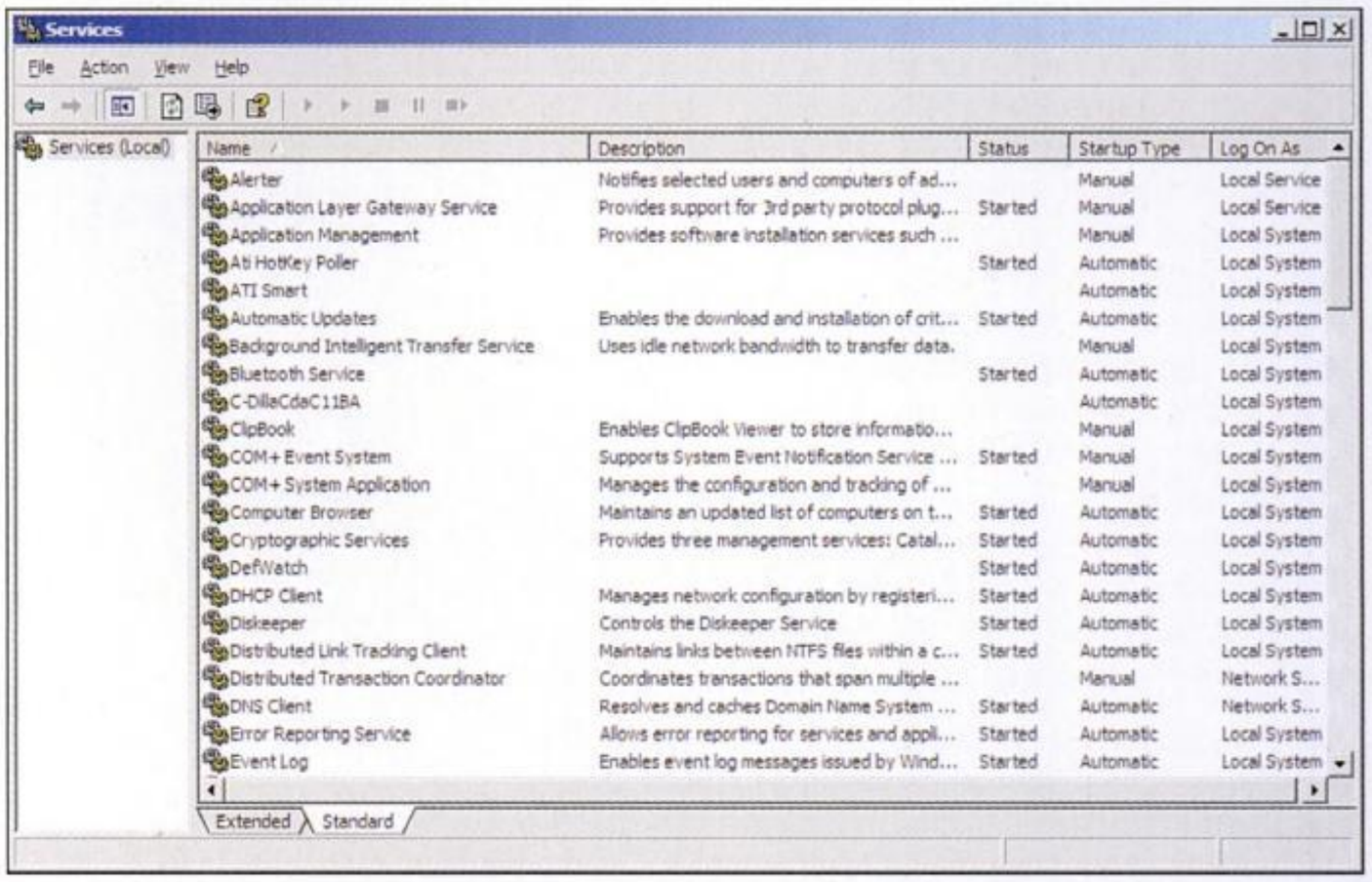
drive. If the path to the application doesn't give you a hint, open My Computer and browse down to the program. Right-click it, and select Properties. Click the version tab, and browse through the options there. Look for a company name or product name to tip you off. We recommend leaving alone any apps that use rundll32 to run; if you mess with those you can disrupt vital Windows processes.

To disable the startup apps, all you need to do is uncheck the box next to each app's name and reboot your PC. It's that simple.

A service is nothing more than a fancy application that Windows runs at boot, then monitors to make sure it continues running. Disabling unneeded services can help you conserve your precious system resources.



5 TOP-SECRET REGISTRY HACKS

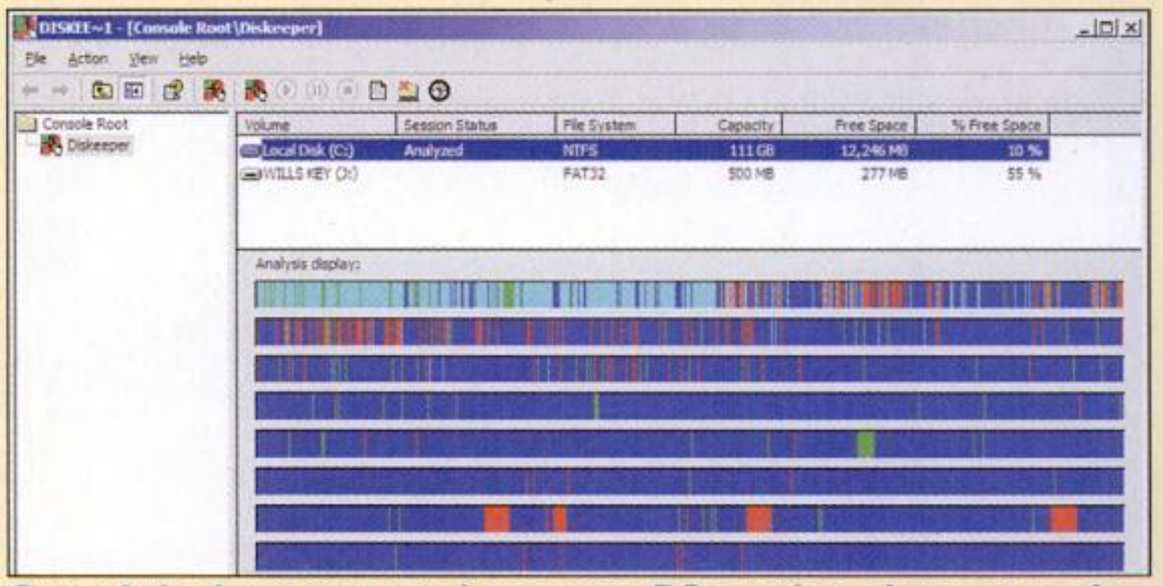
Adding new functionality to Windows is as easy as opening regedit.exe and making some minor changes. *Changes here can break Windows, so make sure to back up your system before you touch anything!*

1 Minimize Outlook to the System Tray: Browse to HKEY_CURRENT_USER\Software\Microsoft\Office\10.0\Outlook\Preferences. Add a new DWORD value named MinToTray, and set it to 1. Next time you restart *Outlook*, it will minimize to the System Tray!

2 Make password-protected screensavers less annoying: You enable a password-protected screensaver to help keep meddlers out of your machine, but you're annoyed when the screensaver starts and you're locked out. The solution: Add a grace period. If the screensaver activates, but you move the mouse during the grace period, you can get right back to work, without typing your password again. Browse to HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon and modify ScreenSaverGracePeriod. The value is stored in seconds. We like to set the value somewhere between 5 and 30 seconds.

3 Secure your pagefile: The pagefile can contain anything that might be in RAM, including sensitive data like passwords. To set XP to automatically erase any info contained in it, go to HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\Memory Management and add a DWORD value named ClearPageFileAtShutdown. Set it to 1, reboot your PC, and your machine will automatically erase the contents of your pagefile when you shut down. Be aware that this will make your PC take longer to shut down.

4 Remove the annoying compression options from the Disk Cleanup Wizard: The Disk Cleanup wizard is a handy way to find out what unused files you can get rid of, but it also calculates the space you'll save by compressing your drive. We don't like to use compression, so we're going to disable it by browsing to HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Explorer\VolumeCaches\Compress old files. Clear the value from the Default key. The next time you start Disk Cleanup, it will skip the compression analysis.



One of the best ways to keep your PC purring along at peak performance is to frequently defragment your drive. You can even set *Diskeeper* (shown here) to run automatically!

5 Customize the folders listed in your Open dialog boxes: Whenever you open a file in *Notepad* or *Paint*, there's a default list of folders on the left side of the Window. Unfortunately, those folders are just not that useful for most people. To customize them, point Regedit to HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Policies\comdlg32 and create a new key called Placesbar. Inside that new key, create a String called Place0 and point it to the folder you want to appear on the open dialog, say, C:\CurrentWork. Create another String called Place1 and point it to another location on your drive. You can use variables (%USERPROFILE% will point the folder to the profile of a currently logged-in user) or URLs, so you can even use network shares. This hack won't change the same dialogs in *Office*, but if you have *Office XP*, you can add new folders to the Placesbar by going to File, Open, and browsing to the folder you want to add. Once you have it selected, go to Tools and click "Add to My Places."

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Turn off unnecessary services in Windows XP Pro

By default, Windows XP Professional loads more than 20 services that do everything from facilitating easy wireless networking to monitoring your PC's health. Many of these services can be safely disabled by home users, which frees up memory and the occasional CPU cycle. To disable a service, go to the Control Panel, then Administrative Tools, then the Services hotkey. Right-click the service you want to disable and select Properties. Then change the Startup Type to Disabled or Manual. Disabling the wrong service could cause odd things to happen, so keep track of what you're modifying, and if you experience any unexplained PC phenomena, re-enable the services you've turned off. Here's our list of tried-and-true services that are safe to disable:

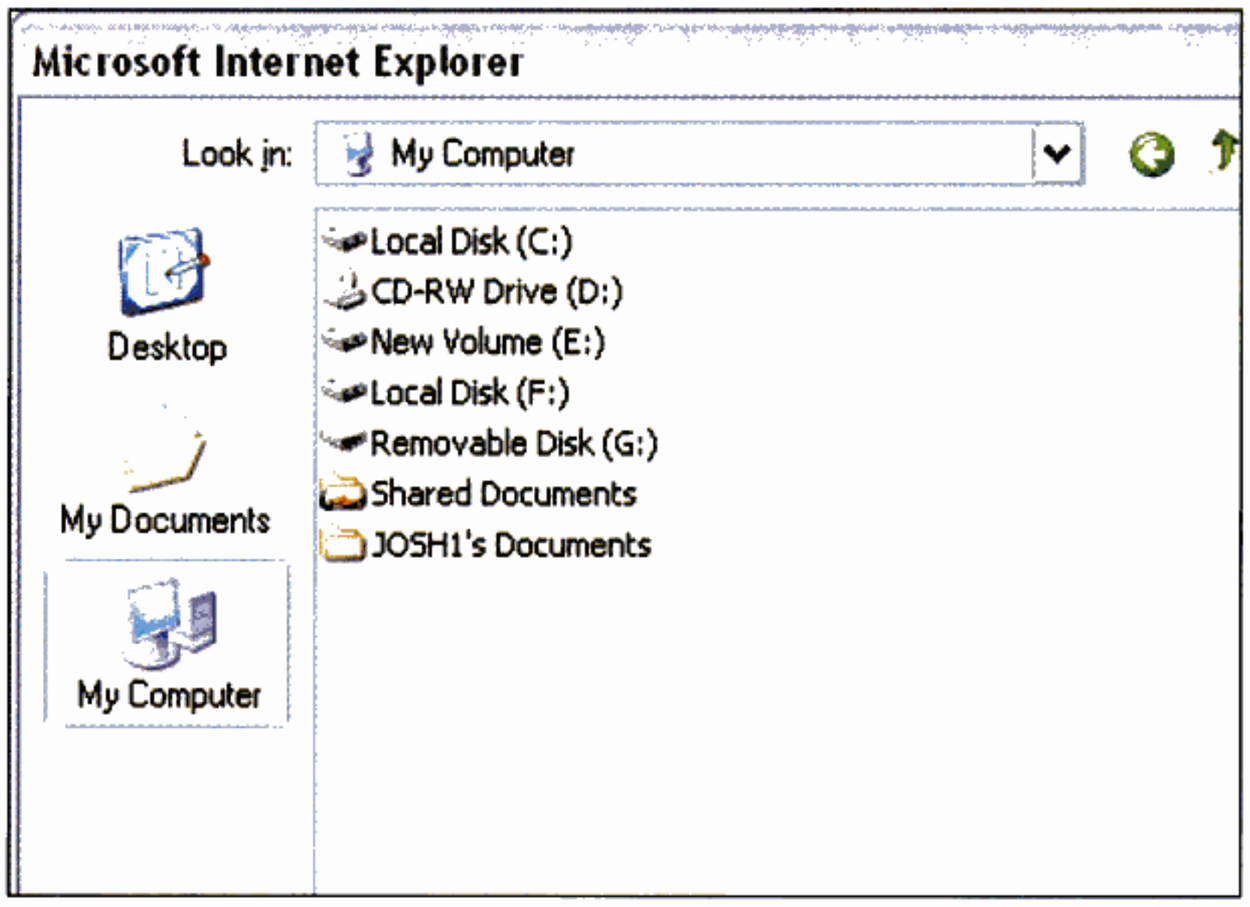
• **ClipBook:** This service lets you share stuff on your clipboard with other people across the network. Kill it.

• **Application Management:** Not on a network? Don't ever plan on remotely installing an app? That's what this service does, so feel free to kill it.

• **Distributed Link Tracking Client:** Another network-based service, this automatically updates your shortcuts to files on remote volumes if they're moved. If you don't use a file server, kill this one.

• **Error Reporting:** Automatic error reporting can get pretty annoying, especially if you're dealing with a misbehaving app. You can kill this service to permanently disable the error report.

• **TPC/IP NetBIOS Helper:** You only need this service running if you use NetBIOS over TCP/IP. If you don't, feel free to kill it.



Customizing your "My Places" will allow you to save time opening and saving your files.

Customize Windows' preset folder display

Whenever you open a file on your PC, Microsoft lovingly presents you with preset folder options on the left side of the dialog box. Thanks, Redmond, but we don't open items from our History or Favorites very often. Here's how to put what you want in that list.

• Go into the Registry and cruise to HKEY_Current_User\Software\Microsoft\Windows\CurrentVersion\Policies\comdlg32.

• Create a new key called Placesbar.

• Inside this key create a string named Place0 and point it to the folder you want to appear in the Open dialog box, such as C:\CurrentWork, for example.

• Create another string called Place1 and point it to another location on your drive.

• An easier way to tackle this tweak is to download TweakUI, which will allow you to similarly customize your menus. Just open Common Dialogs, Placesbar, then select or type the locations of your preferred folders.

10 EASY WAYS TO TOUCH UP WINDOWS XP

1 **Clean out your System Tray:** Every unnecessary app running on your PC saps precious CPU cycles and memory.

2 **Update your drivers:** New videocard and chipset drivers can help you reap performance dividends.

3 **Enable DMA for your drives:** Go to the Device Manager and take a look at the properties of your Primary IDE Channel. On the Advanced Settings tab, make sure that DMA, if available, is checked for both devices. Rinse and repeat for the Secondary IDE Channel.

4 **Visit Windowsupdate.com regularly:** Patches don't just protect your PC, they also improve performance.

5 **Convert your drives to NTFS:** Get the most from your drives by converting them to NTFS. Open a command line, and type `convert x: /fs:ntfs`, but replace x with your drive letter. Back up your important files first!

6 **Use Quick Launch:** Instead of cluttering your Desktop with loads of shortcuts, right-click the Taskbar, go to Toolbars, and make sure Quick Launch is checked. Then drag your favorite shortcuts to the Quick Launch bar for easy access, anytime.

7 **Speed up your UI:** Bells and whistles are great, but faster is better. Go to the Display control panel, click the Appearance tab, and hit the Effects button. Uncheck the first two options, as well as "Show shadows under menus."

8 **One click to Device Manager:** To open Device Manager in Windows XP without the hassle of going to System Properties, just create a shortcut to devmgmt.msc.

9 **Fire up the Onscreen Keyboard:** If you need to type something and your keyboard's not available, Open My Computer and browse to C:\Windows\System32 and double-click osk.exe. You can use the onscreen keyboard by pointing and clicking at individual characters.

10 **Defrag:** Regular defragmentation can improve your machine's hard drive performance by massive amounts. To start Defrag, right-click your hard drive in My Computer, select Properties, go to the Tools tab, and then click Defrag.

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How to... Speed Up Your Games

Frame rate is everything in 3D games like *Pacific Assault*. Over-clocking your videocard can give you an edge.

Read on to find the perfect balance of frame rate and visual quality in today's demanding 3D games!

Get an easy, fast speed bump, without overclocking!

This is a trick we picked up from sneaky system vendors who use it to gain a decent performance boost in exchange for image-quality degradation.

- Open your Display Properties by right-clicking the Desktop and selecting Properties.
- Go to the Settings tab and click Advanced.
- Go to the Image Quality tab on nVidia cards or the 3D tab for ATI cards. Browse to the custom setting and change the texture quality to the minimum setting. Do the same for the mip-map levels slider. Your image quality will decline drastically, but your frame rates will get much better!

Use profiles to make switching from multiplayer settings to single-player settings simple and fast

Both ATI and nVidia have a feature in their latest control panel applications that lets you save all vendor-specific videocard settings in a profile. We recommend you set up one profile with high image-quality settings for single-player games, and a low-quality profile for online games in which you want to max out your frame rates.

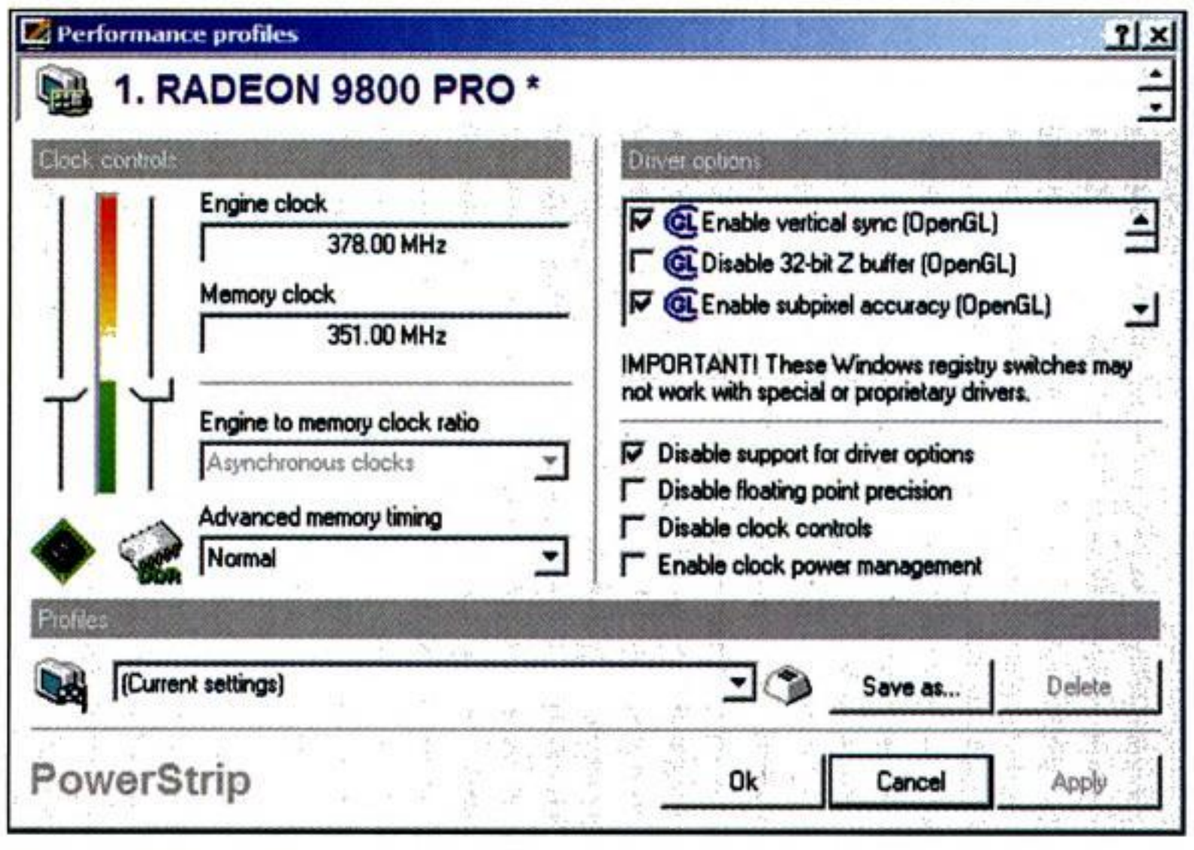
Overclock your videocard for a frame-rate boost

Getting a few more frames per second can mean the difference between life and death in a heated online deathmatch. Most videocards have plenty of headroom, which gives you a perfect opportunity to crank up the clock speeds and get a little more performance from a struggling system. Remember that overclocking voids your warranty, and just because we've never heard of anyone frying their videocard by overclocking, doesn't mean it's not entirely possible.

Our favorite videocard overclocking app is *Powerstrip*. Download *Powerstrip* at www.powerstrip.com and install it on your PC. Once it's running, right-click the System Tray icon, select Performance, and click Configure. You should see two vertical sliders: one for the engine (aka core) clock and one for the memory clock. To overclock your card, all you need to do is move the sliders up.

We recommend you take baby steps when you overclock videocards. Start with 5MHz increments for a single clock. Adjust the core clock first, then test your card by playing an intensive game. When you're playing, watch the screen for any artifacts, static, or deformed polygons. Once you're sure the card is stable at the new clock rate, bump the core clock up another 5MHz. You'll know you've reached your board's limit when you see visual artifacts while testing. When that happens, exit the game and drop the core clock back down 5MHz.

Once you've tested your core clocks, it's time to get started on the memory. Don't expect to push your videocard's memory as far as you can the core clock. Also, you need to remember that the memory clock reported here is the actual clock speed of your card's double data-rate memory, not the effective clock speed that is written on your product's box. Increase the memory clock in small increments using the slider in *PowerStrip*, then test the changes using stressful games.



***PowerStrip* is the overclocking gateway drug. It makes overclocking your videocard as easy as moving a pair of sliders, and even protects you from doing something stupid.**

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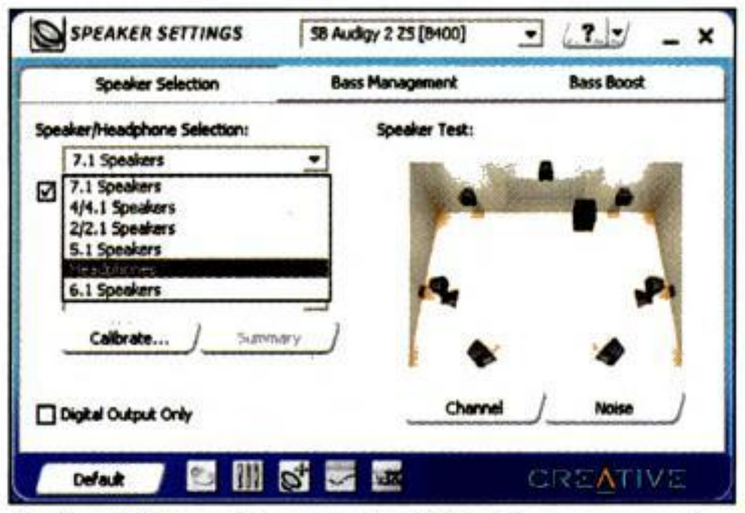
How To... OPTIMIZE Windows Audio

A step-by-step guide to tweaking your PC Experience

Tune and perfect Windows XP's audio settings



Not setting the applet for the correct output device will cause audio artifacts or incorrect audio rendering.

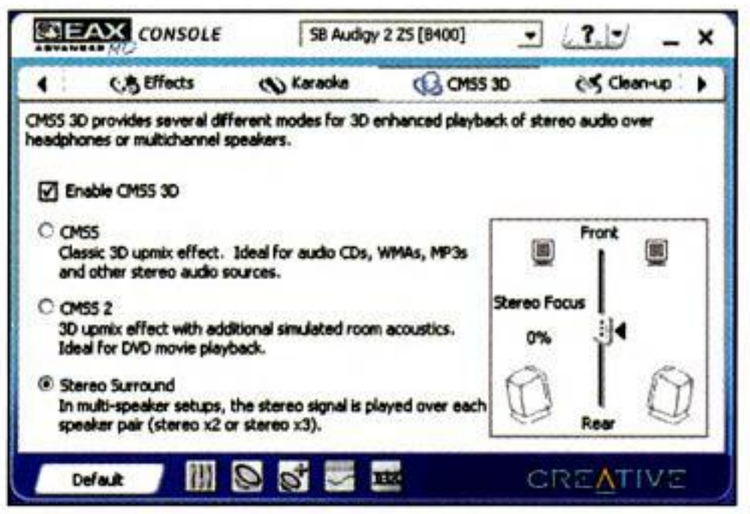
Set your soundcard for the type of output you're using

If you're like us, you use speakers in the day and switch to headphones when your wife, husband, or roommates go to bed. However, switching to headphones from speakers isn't just a simple matter of jacking in. Modern advanced audio hardware uses complex algorithms to render audio. These algorithms are so precise that playing with headphones when the soundcard is still set to render for desktop speakers will make everything sound a little off and/or distorted.

To optimize your audio for your output device, steer to your soundcard's speaker configuration applet and look for a setting that lets you change it to 7.1, 6.1, 5.1, 2.1, or headphones. In some cases you may have to reboot. If your card doesn't have an applet control for speaker configuration, use the one built into Windows XP. Go to Control Panel>Sounds and Audio Devices, and under Speaker Settings select Advanced. Then pick your poison. In cards like the Sound Blaster Audigy 2 ZS or onboard audio devices like Analog Devices' SoundMax, setting the application applet will override the Windows XP setting. Keep in mind that some soundcard drivers may need you to set both the Windows XP control panel and the soundcard applet for the setting to work properly.

Enable stereo expansion modes

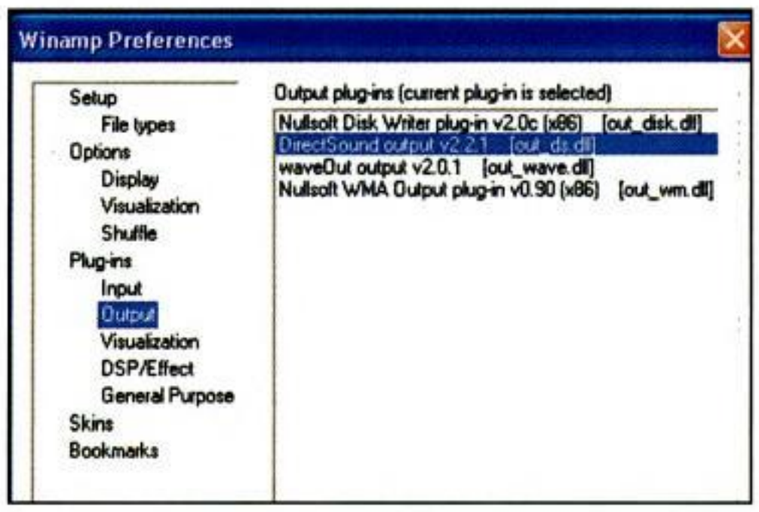
If you have a set of 7.1 or 5.1 surround speakers hooked up to your PC and you play mostly MP3 or CD audio, you may have noticed that audio only comes out through the front pair of stereo speakers. That's because, unlike video games or DVD movies, the source audio on most MP3s and CD audio is stereo only. Fortunately, most advanced audio hardware today features expansion modes that can filter the audio. In these filtered modes, music and vocals can be shunted to the front speakers while instruments get sent to the rear. Other modes duplicate the front stereo to the rear for a fuller sound. To enable this, poke around in your audio applet and look for an expansion check box. In the popular Creative Labs series of Live!, Audigy, and Audigy 2 cards, it's called CMSS or CMSS2. Enabling audio expansion or just turning on Stereo Surround should give those other slacker satellites some work.



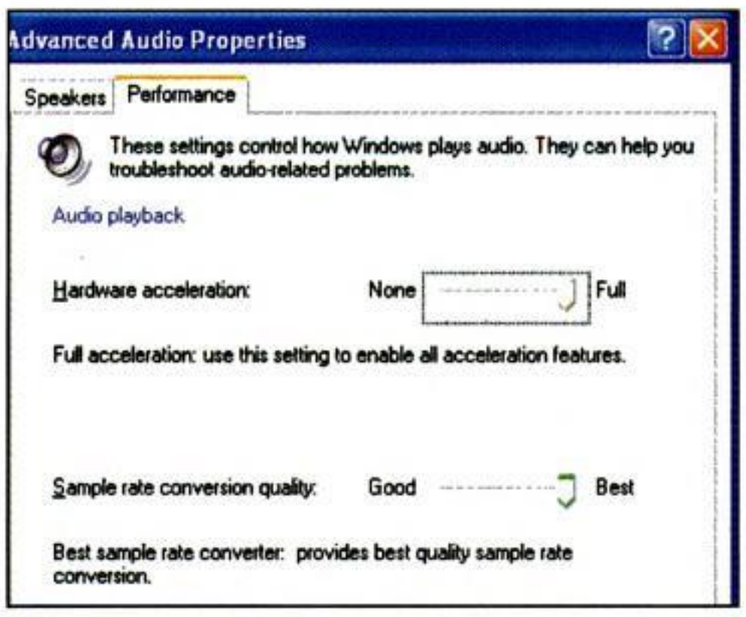
Setting the Creative Labs' control panel to Stereo Surround or CMSS lets the soundcard up-mix stereo source material to your surround sound speakers.

DirectSound good, wave-out bad

Applications such as the popular *WinAmp* and many soft DVD players default to the wave-out for audio. Unfortunately, using wave-out does all the mixing in software, thus stealing precious CPU cycles. That may not matter if you're pushing a 3.2GHz P4 or Athlon 64 FX hog, but if you paid extra for an Audigy 2 ZS or nForce2 motherboard with advanced audio, what's the point of rendering it on the CPU? To set your PC to use DirectSound over wave-out, go into the configuration or setup section of your application (in *WinAmp*, hit Ctrl-P and select Plug-ins, Output). Set it to DirectSound for hardware-acceleration goodness. In *InterVideo WinDVD 5*, it's under Audio/Advance Audio. Then simply set it to DirectSound.



Setting your audio applications to use DirectSound over wave-out will let the hardware acceleration of your soundcard or motherboard do the heavy lifting.



If hardware acceleration is turned down even a notch, most sound systems will turn off all acceleration.

Ask the Doctor

I lowered the hardware acceleration for my soundcard by a little bit, and now my PC is crawling. What gives?

Sound vendors tell us that a big complaint from consumers is the performance decrease that results from turning off hardware acceleration. Duh. What we didn't know, however, is that lowering hardware acceleration even a notch usually disables all hardware audio acceleration. To make sure yours is set correctly, go into Control Panel>Sounds and Audio Devices Properties. Under Speaker Settings, click Advanced and then click the Performance tab. Make sure Hardware Acceleration is all the way to the right. Yes, the other right.

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How To...

A step-by-step guide to tweaking your PC Experience

CUSTOMIZE YOUR Interface

Turn Windows XP into a more efficient, effective, and attractive OS with these simple, painless steps

Force alphabetic sorting of the Program menu

Clicking "Sort by Name" in the All Programs menu makes finding your applications a lot easier, but Windows XP needs constant reminders to sort applications this way. This tweak will permanently sort all your programs alphabetically.

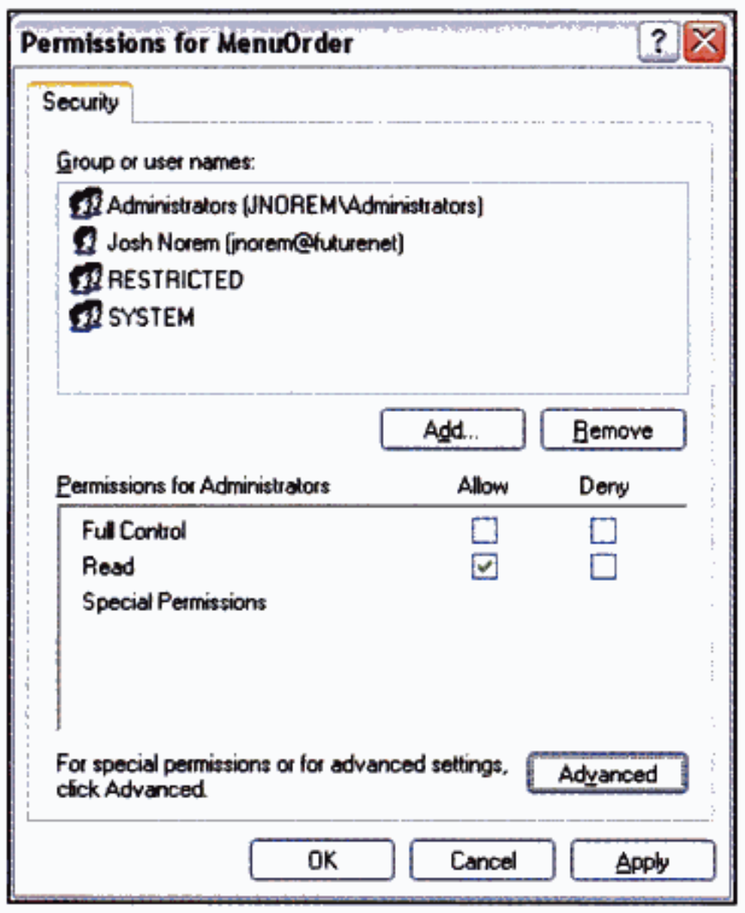
• Open the Registry (Start>Run, type "regedit") and go to HKEY_Current User\Software\Microsoft\Windows\CurrentVersion\Explorer\Menu Order.

• On the Edit menu, select Permissions.

• In the "Permissions for MenuOrder" dialog box, click Advanced.

• In the "Advanced Security Settings for MenuOrder" dialog box, clear the "Inherit From Parent" check box.

• In the security dialog box that appears, click Copy.



Tired of constantly telling Windows to sort your programs by name? It's time to make the changes stick.

• Click OK to return to the "Permissions for MenuOrder" dialog box, and then clear the "Full Control Access" entry for your own account and for any security groups that you're a member of, leaving the "Read Access Control" entry in place.

Group your taskbar more effectively

Windows XP automatically groups applications together when the taskbar fills up, but you can make it group items whenever you'd like.

• Open the Start Menu, select Run and type Regedit.

• Go to HKEY_Current_User\Software\Microsoft\Windows\CurrentVersion\Explorer\Advanced.

• Click Edit, select New, and then DWORD value.

• Name this new value: TaskbarGroupSize

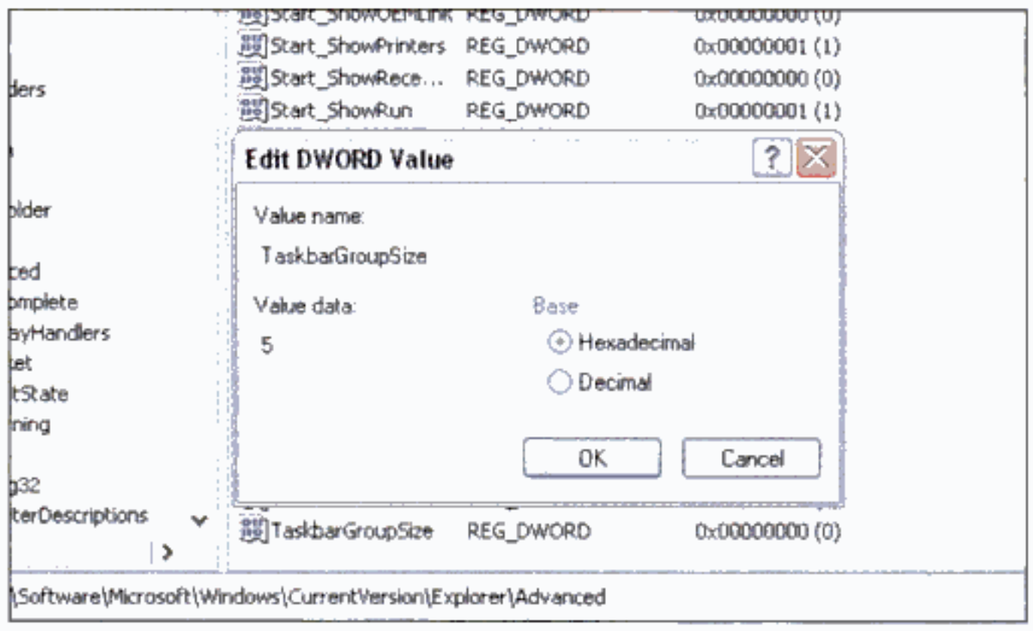
• Once named, right-click it and select Modify.

• Type in the number of windows that appear before Windows starts grouping them. We like the number five, but use a smaller number if you want an uncluttered taskbar, or a higher number if you like to see each open window.

Make your Start menu easier to navigate

Is Start-menu clutter chapping your hide? Put a little breathing room between all those apps with this handy hack.

• Right-click your desktop and make a new shortcut. Select any target for this shortcut (it really doesn't matter which).



If you want to avoid Taskbar clutter, pick a low number for this setting to keep multiple windows of the same app grouped together.

• To give the shortcut a name, erase any text in the Name field and hold down the ALT key while punching 0160 on the number pad, which will give the shortcut an empty field for a name. Click OK.

• Right-click the new shortcut and remove the target. Next, click Change Icon and select a blank icon. Now simply drag it onto the start button, and then drag it to the desired location.

Get rid of your eBooks once and for all

It happens to us all: You deleted your My eBooks, My Videos, and My Music only to open up the same folder a few minutes later and find they had in fact not been deleted after all. It's time to get rid of them for good!

• Go to Start, then Run.

• Type Regsvr32 /u mydocs.dll and hit Enter.

• Go into My Documents and delete any of those "My" folders you want—they're not coming back!

We love pinning apps to the Start menu, but when the list gets too long, it's time to add one of these separators to make navigation easier.

Add your own user-account pictures

XP's default account icons are kind of lame. Here's how to add your own images.

• Resize your .bmp images to 48x48 pixels. (You can use the trial version of Paint Shop Pro 9, which is on the CD, to do this.)

• Copy your images to C:\Documents and Settings\All Users\Application Data\Microsoft\User\Account Pictures\Default Pictures. (Application Data is a hidden folder.) You can also delete any pictures you don't want.

• Click the Start button, then click over the account image. This will take you to a new window that tells you to choose another pic for your account. Find your picture, select it, click Change Picture, and you're done.

Hide the Recycle Bin from your desktop

Can the trash can via the Registry. Open Regedit and explore HKEY_Current_User\Software\Microsoft\Windows\CurrentVersion\Explorer\HideDesktopIcons\NewStartPanel. Make a new DWORD value with the name {645FF040-5081-101B-9F08-00AA002F954E}. Set the Modify value to "1".

To restore the Recycle Bin, Modify the same DWORD value to "0."

An even easier way to remove the Recycle Bin is to download TweakUI, one of Microsoft's Windows XP Powertoys. Once installed, go to the Desktop section, and uncheck Recycle Bin.

Change the logon background color

Open *Regedit* and navigate to the following Registry key: HKEY_Users\Default\Control Panel\Colors. On the right-side details panel, double-click Background String Value. Change this number to a three-digit RGB value, then click OK.

Hide system tray icons

Want to make it look like you have no apps running in the background? Or maybe you just need to hide one or two more, um, private apps down in the Systray? Enter Regedit and navigate to HKEY_Current_User\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer. Add a REG_DWORD entry titled "NoTrayItemsDisplay." Open it and assign a hex value of "1" to hide the icons. Close Regedit, reboot the system, and the icons should be gone. If you need to call them up, just bring up the Windows Task Manager.

Remove image preview

Open Regedit and delete the following key: HKEY_Classes_Root\SystemFileAssociations\Image\ShellEx\ContextMenuHandlers\ShellImagePreview.

Learn Windows keyboard shortcuts

Here's a brief list of some of our favorite time-saving keystrokes:

• Alt + Shift + Tab: Goes through your apps in reverse order.

• ALT + d: Moves the cursor in IE to the address bar.

• Shift + insert a CD: temporarily disables Autoplay.

• Windows key + Pause/Break: Opens System Properties.

• Windows key + f: Opens the Search Window.

• Windows key + e: Opens Windows Explorer.

• Windows key + d: Minimizes all windows

Assign keyboard shortcuts to your favorite applications

Quickly and easily access your favorite applications and files by right-clicking an icon on the desktop or in an open window. Click Properties, then go down to the Shortcut Key field and enter the desired keystrokes.

Ask the Doctor

I have dual displays. How can I set up Windows to use a different desktop image on each monitor?

Try this little hack, which allows you to use different desktop wallpaper for each of your displays. As always, be sure to use a high-res image to reduce dithering.

• Right-click your desktop, then select Properties.

• Under the Desktop section, select Customize Desktop, then select the Web tab.

• To use an image file located on your hard drive, select New and browse to the file's location. Once you've selected the file you want, click OK, and it will appear on your desktop.

• Now, simply drag the image over to the second desktop, and from the image's pull-down menu in the upper left-hand corner, select Cover Desktop.

• Right-click and select Arrange By and "Lock web items on desktop." Now you can select a standard desktop for your primary display, and use the web object to cover the standard desktop image on your second desktop with the image, or images, of your choice.

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How To...

A step-by-step guide to tweaking your PC Experience

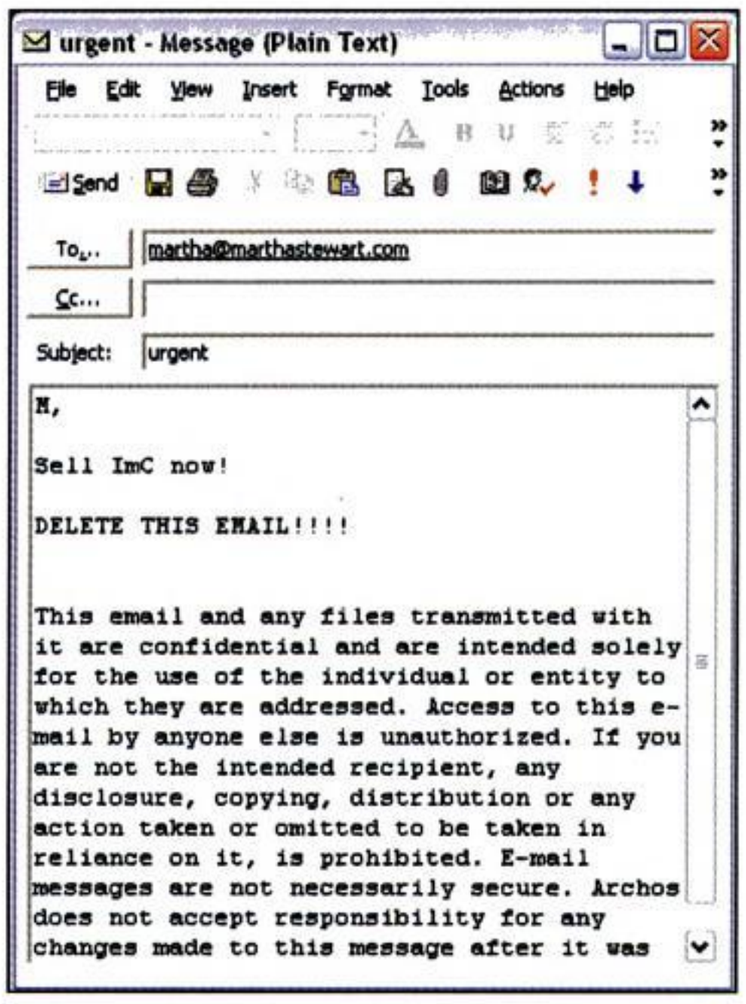
Accelerate Your Apps

When it comes to our applications, optimization is next to godliness. Here are our favorite tips for speeding up *Microsoft Outlook*, *Microsoft Word*, and *Windows Media Player*!

e-mail without starting *Outlook*

Sometimes you just want to dash off a quick e-mail without having to launch a big-ass app like *Microsoft Outlook*. Well, now you can.

- Right-click the desktop and select New, and then Shortcut from the pop-up menu.
- A wizard launches; type mailto: in the location box (don't forget the colon at the end).
- Name your shortcut something illuminating like "New Email."
- From now on, whenever you want to dash off an e-mail when *Outlook* isn't open, just double-click this shortcut, state your business, and click Send. This trick will actually work for other e-mail clients as well, as long as the application is the default MAPI e-mail client.



You can write and send a quick email using *Outlook* without having to launch the whole application.

Customize your *MS Word* File Cabinet

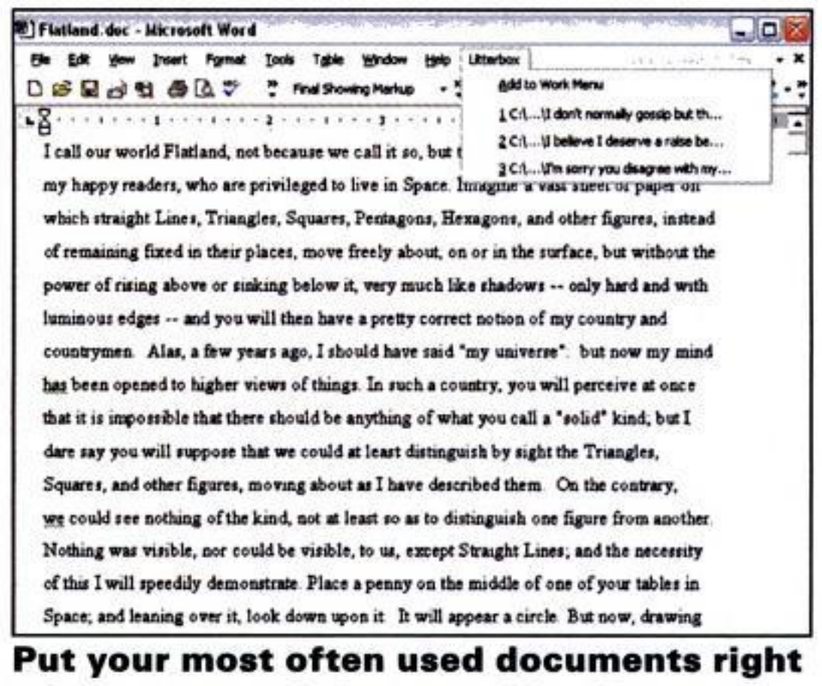
This one is so convenient and fun, we occasionally wonder if it's illegal. You can establish a list of your own frequently used documents directly in Microsoft Word's menu bar. Add templated letters with boilerplate text ("Dear John..."). Create a separate menu for all the documents you're plagiarizing for your term paper. Go crazy—here's how.

- Fire up *Word*.
- Go to Tools > Customize.
- In the Categories pane (left side), scroll down to Built-In Menus and click it to highlight the selection.
- In the Commands pane (right side), scroll down to Work. Click it, drag it to the menu bar, and release the mouse button.
- Don't close the Customize window yet! Click your new Work folder to highlight it if it isn't already highlighted, and in the Customize window, click Modify Selection. A drop-down list will appear, allowing you to change the name of the folder. You can also add an ampersand (&) before a character to create a hotkey so you can access the menu with the Alt-key combo (for example, St&uff will let you access the menu by pressing Alt+u).
- Now click on Close in the Customize window.
- To add documents, just open them, click the new menu item, and select Add to Work Menu. Life is good. To remove them—this is a little weird—press Ctrl-Alt-(hyphen). Your I-beam cursor will turn into a thick horizontal bar. Using this cursor, select your menu item, position the cursor over the document you want to delete, and press the trigger. Sayonara!

Tweak Windows Media Player 9

Now, let's have some fun with *TweakMP*, a bundle of utilities designed to configure *Windows Media Player* to your taste. Go to www.wmplugins.com, select Plug-Ins & Skins from the menu bar at the top, select Toys and Utils from the drop-down menu, and then scroll down the list to "TweakMP PowerToy for Windows XP." One of the first things to do is shorten the time it takes the mouse pointer and menu to disappear when you go full screen (as shown in the screen-shot below).

While you're at it, you can download the *Windows Media Bonus Pack* at the same location. Among other things, you'll get a badass plug-in that allows you to export playlists to *Microsoft Excel* for perusal or printing. You can, for example, simply cut the playlist from *Excel* and paste it into an illustration program for creating a CD or DVD sleeve. Get the picture? ■



Put your most often used documents right where you need them—on *Word's* menu bar.

Microsoft puts you behind the controls of *Windows Media Player 9* with TweakMP.

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How To...

A step-by-step guide to tweaking your PC Experience

Shoot and Score

Take better photos, fix the flaws, and get perfect prints

MAXIMUM PC
TIME TO COMPLETION
TROYL*
HOURS MINUTES
*The Rest of Your Life

What You'll Need

- A computer with a USB port
- Any digital camera with manual controls
- Image-editing software such as Adobe *Photoshop Elements* ($100, **www.adobe.com**), *LView Pro* ($40, **www.lview.com**), or *Pixia* (free, **http://park18.wakwak.com/~pixia**)
- Color printer

If you want to take pro-level pics this holiday season, you're in the right place. Any bozo can take OK shots with most point-and-shoot digital cameras, but with a little extra know-how, your digital pictures can look incredible!

Sure, cameras have plenty of autopilot controls that'll do the dirty work for you, but they won't always give you the results you're after. You'll get better, more compelling pictures if you exercise some control over the exposure, shutter speed, and focus settings. To help you get the most out of your investment, we show you how to work your camera's controls to capture great images, fix problems and enhance details in an image editor, and optimize your pics for print.

Shoot Better Pictures

Before we can show you how to touch up your pics, you need to get familiar with how pictures are made. For a camera to create an *exposure*—an even balance of highlights and shadows—light from a subject enters the camera, exposes the image sensor, and becomes digitized. Your camera has two controls—the aperture and shutter—that can be automated or manually controlled to regulate the amount of light that enters the lens.

The aperture is a hole surrounded by thin blades that can be widened (lets in more light) or narrowed (lets in less light). It functions like your eye's iris and pupil. The shutter functions like a gate, controlling how long the image sensor is exposed—think of it as the eyelid.

Using the Aperture

Step 1—Consider Your Composition

Aperture size, measured in *f-stops* (the larger the number, the narrower the size), affects the focal range within an image, and can help you capture compelling portraits and still lifes.

A wide aperture (such as f-2.8) creates a narrow *depth of field*—the range in which all objects appear to be in

Place several objects at different distances away from you, so you can see how your camera's aperture setting affects the depth of field.

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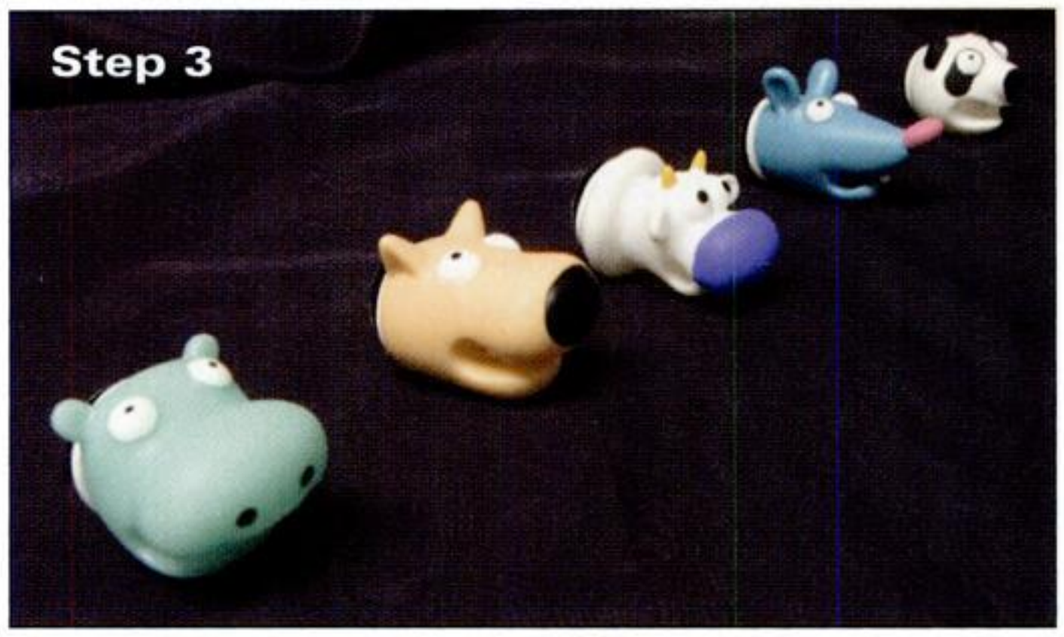
By opening your aperture all the way, you can create a very narrow depth of field, and focus in on a thin slice of a scene.



If you want a greater depth of field, close your aperture as much as possible.

sharp focus—to capture a sharply focused subject while blurring its foreground and background. A narrow aperture (such as f-16) creates a wider depth of field to capture a larger range of objects in sharp focus. Depth-of-field capabilities vary—SLRs generally offer a greater range than cameras with built-in lenses.

One of the great things about a digital camera is it doesn't cost anything to experiment! To explore your camera's abilities, grab some small objects (like gummy bears or green army men) and place them in a 1- to 2-foot area on a well-lit tabletop, and try capturing your subjects using different settings. Be as creative, messy, or creatively messy as you want—it's your picture.

Step 2—Go Wide for Narrow Focus

To isolate one object from many, set a wide aperture. Objects that are some distance in front of and behind your focal point should appear slightly blurred—again, depending on the lens in your camera, your mileage may vary.

Set your camera to Aperture Priority (flip the dial to A or Av). In this mode, the camera automatically sets a compatible shutter speed for your aperture and subject. Get up close to your composition and angle the camera so you're capturing a range of objects in your frame. Then set your camera to its widest aperture (the smallest number available, such as f-2.4—view this in the viewfinder or LCD). Focus on one object in the center of your frame, press the shutter-release halfway to lock the focus and exposure, and then press down fully to take the picture. (We shot this at f-2.8.)

Step 3—Go Narrow for Wide Focus

To create an image that shows all or most objects in sharp focus, use a narrow aperture. Frame your composition the same as in Step 2 and set your camera's aperture to f-8.0 or smaller. Focus on the same center object, press the shutter-release halfway, and then press it fully. (We shot this at f-18.)

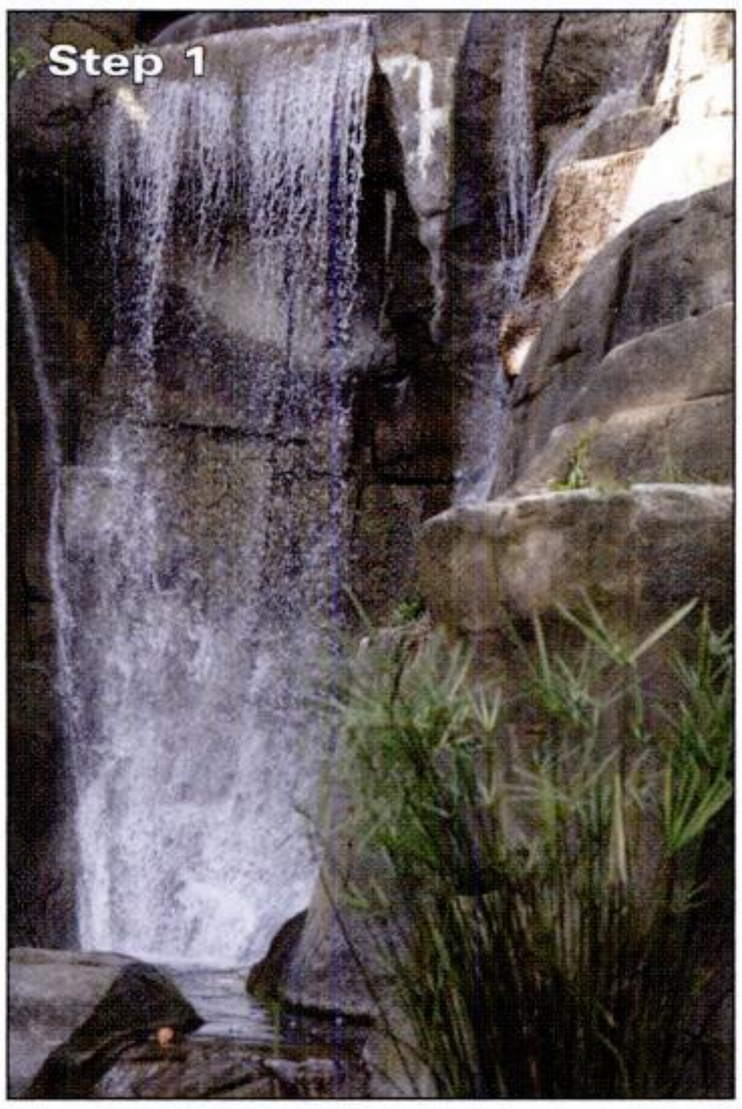
To see what changes in the depth of field look like, shoot at a variety of aperture sizes, making sure to frame the composition identically in each snap. When finished, download your pics to

Using the Shutter

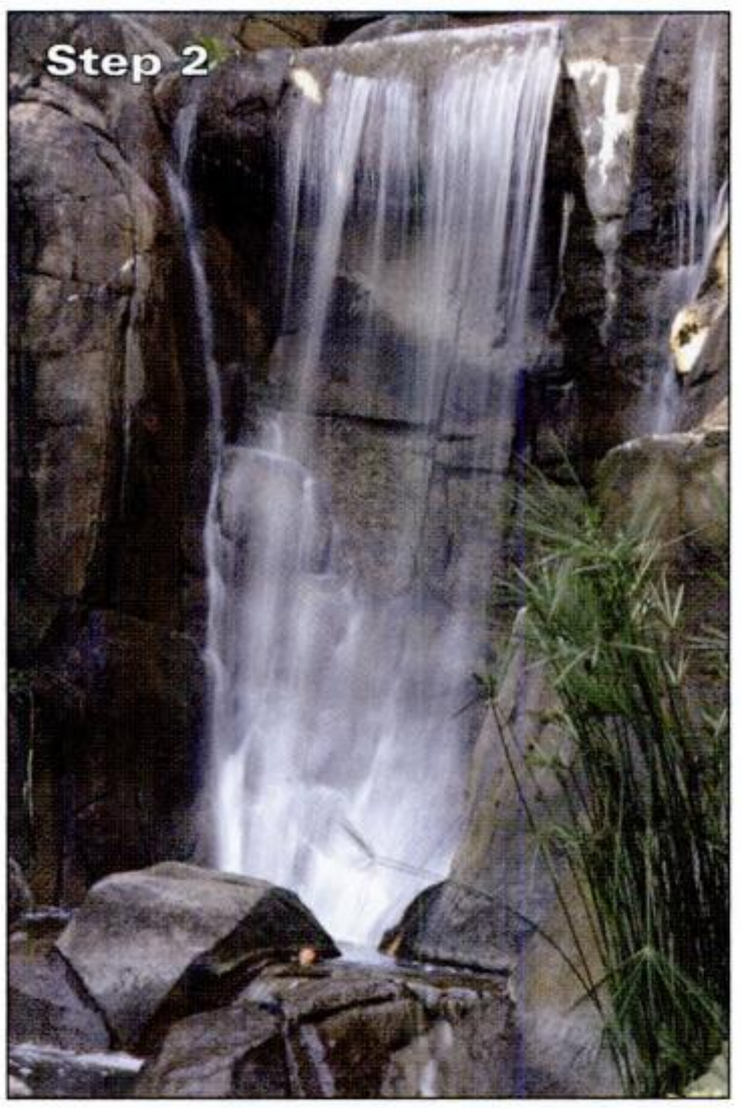
Step 1—Freeze Action

If you're shooting moving objects (like Junior riding his new bike), use Shutter Priority to freeze or capture motion. Remember that the shutter speed is the length of time the camera's sensor is exposed to the image you want to capture. Shutter speeds can range from thousandths of a second to many minutes. If you want to freeze action, such as a speeding race car or your pooch snagging a Frisbee mid-air, you must use a really fast shutter speed.

Find a place with moving objects, like a busy street, a basketball game, or a waterfall. Switch your camera to Shutter Priority (S or Tv)—your camera will automatically set a compatible aperture for your shutter speed and composition—and compose your shot. Set a fast enough shutter to freeze your subject's motion: If you're shooting cars, try 1/200 of a second; if you're shooting guys shooting hoops, try 1/125. Then shoot and review your image. If the subject's blurry, set a faster shutter. If the subject is frozen but



A fast shutter speed can freeze even the fastest-moving object in flight!



Using a low shutter speed lets you add motion blur to your shots. Anything slower than 1/60 can result in blurry images, especially if you don't use a tripod!

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the image is underexposed (dark), set a slower shutter that's fast enough to freeze the action. This 1/500-second shutter shot transformed the water flow into droplets.

Step 2—Capture Motion

To add some creativity to objects on the move, use a slow shutter to capture motion. A slow shutter can capture the rush of falling water, the glowing trails of car headlights at night, or the dizziness of a merry-go-round. It'll also capture camera shake if you're handholding the camera, so use a tripod if you've got one (or cut back on the caffeine).

Find another moving subject (or chill with the one you froze above), compose your shot, and set a slow shutter for your object's movement. If you're shooting cars at night, try 1 second or longer; if you're shooting a merry-go-round, try 1/20 of a second. Then shoot and review. If you have too much movement, set a faster shutter. Not enough? Set something slower. We used a 4/10 of a second shutter to capture the second waterfall image on the previous page.

Getting the Right Exposure

Step 1—Enlist Exposure Compensation

Sometimes your camera doesn't cut it. Your snowboarding shots came out dark, while your calla lily portrait was overexposed. When you're exposed to bad behavior, enlist the Exposure Compensation (the +/- button). This control lets you tell your camera you want a different exposure than what it's currently providing—press the button.

Most cameras have an exposure value (EV) range of -2 to +2, typically divided into 1/3-step increments (you should see a number in the viewfinder or on the LCD). Zero (0) means no compensation. If your pics are too dark, boost the EV number up a step or two, and take test shots until you get what you want. If your images are too light, lower the EV number a step or two until you're satisfied.

To compensate for an overexposed image—the highlights were blown out—we lowered the exposure a whole step.

Manual mode lets you create some nifty effects—like this halo—that the auto modes would never let fly.

Step 2—Go Full Manual

Exposure Compensation can only go so far—for everything else, there's Manual. This mode lets you fully control the aperture and exposure, allowing you to work around troublesome lighting or tweak it to your creative whim (like we did in our example). To show you how it works, let's play with underexposure.

Instead of heading blindly into Manual mode, use the two-step approach, which helps you get compatible aperture and shutter settings. Find something to shoot. Then switch your camera to Aperture Priority, set an aperture, make note of the shutter speed that your camera sets, and shoot a reference shot. To underexpose the image, switch the dial to M, set a faster shutter speed than what the camera set before, and shoot again. Experiment with different settings—both faster and slower speeds to see how they affect the exposure. Likewise, shoot in Shutter Priority, gauge the camera's auto aperture, and then flip to Manual and vary the aperture size to lighten or darken an exposure.

Step 3—Boost the ISO

Shooting in low light is a whole other beast. While flash helps shed light on

You can manually tweak your image sensor's sensitivity for better results in low-light shooting situations.

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shady subjects, it also obliterates environmental lighting, like at a nightclub or the Vegas strip. If you want to capture the atmosphere, boost the camera's ISO setting. This is also a great way to avoid camera shake.

ISO controls the image sensor's sensitivity—the higher the number, the less time required to get adequate light exposure, meaning the shutter can snap closed faster to help freeze action. Point-and-shoot cameras typically produce more image noise at higher ISOs than SLRs, so beware.

Find a dark place with interesting lights and locate a moving subject. Boost your camera's ISO up to 400 or higher and try to freeze the motion in your shot. If your shot is really blurry, set a higher ISO. Experiment with different ISO and Exposure Compensation settings until you get a good compromise of exposure and sharpness without too much noise.

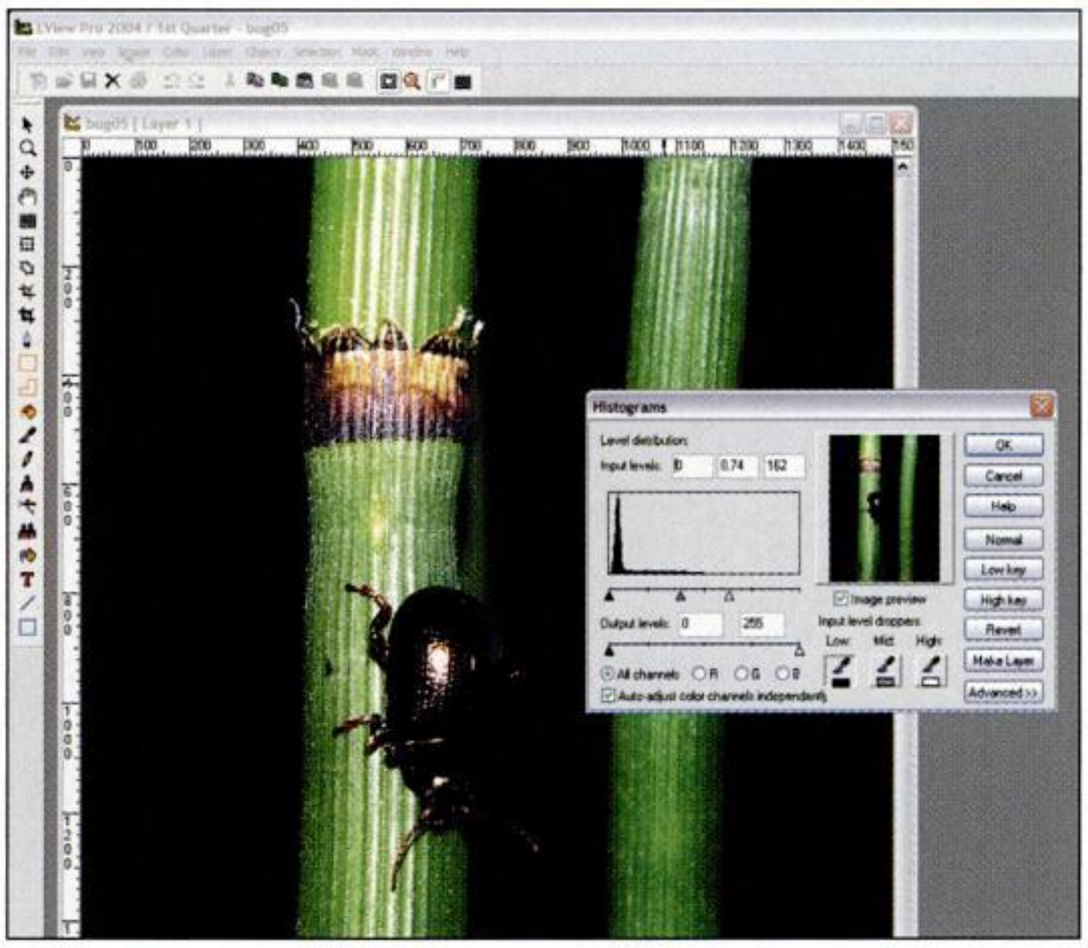
Fix Your Photos

No matter how kick-ass a photographer you are, your photos can benefit from a little photo fix. Whether your images need major resuscitation or just a light sprucing, there are plenty of image editors that'll get the job done. Here, we show you some quick fixes to common problems, using *LView Pro 2004*, a great (and cheap) all-in-one image processor. Other image editors function similarly, but you may have to dig into the documentation to figure out how a specific feature works if you use another app. Before you start editing your photos, create a copy on which you can practice doing your touchups. You don't want to jeopardize the original.

Step 1—Brighten Exposure

One of the most common digital camera problems is underexposure. Underexposure happens when the camera's sensor doesn't detect enough light from some or all of the subject. Luckily, you can easily fix it. In *LView*, select Color > Histograms. In the resulting window, your image's tonal range is represented as a mountain-like graph known as a histogram: black image data (shadows, dark colors) takes up the left region, gray data (shrubs, brick) resides in the middle region, while white data (white clouds, light colors) sits on the right side.

To fix your exposure, check the Image Preview box and then move the white data slider (the white triangle) to the left to brighten the highlights to your liking. Move the gray slider left to brighten the midrange or right to darken it. When you're satisfied, click OK. (In the image at right, we brightened the highlights and then darkened the midrange a bit to punch up our bamboo stalks.)

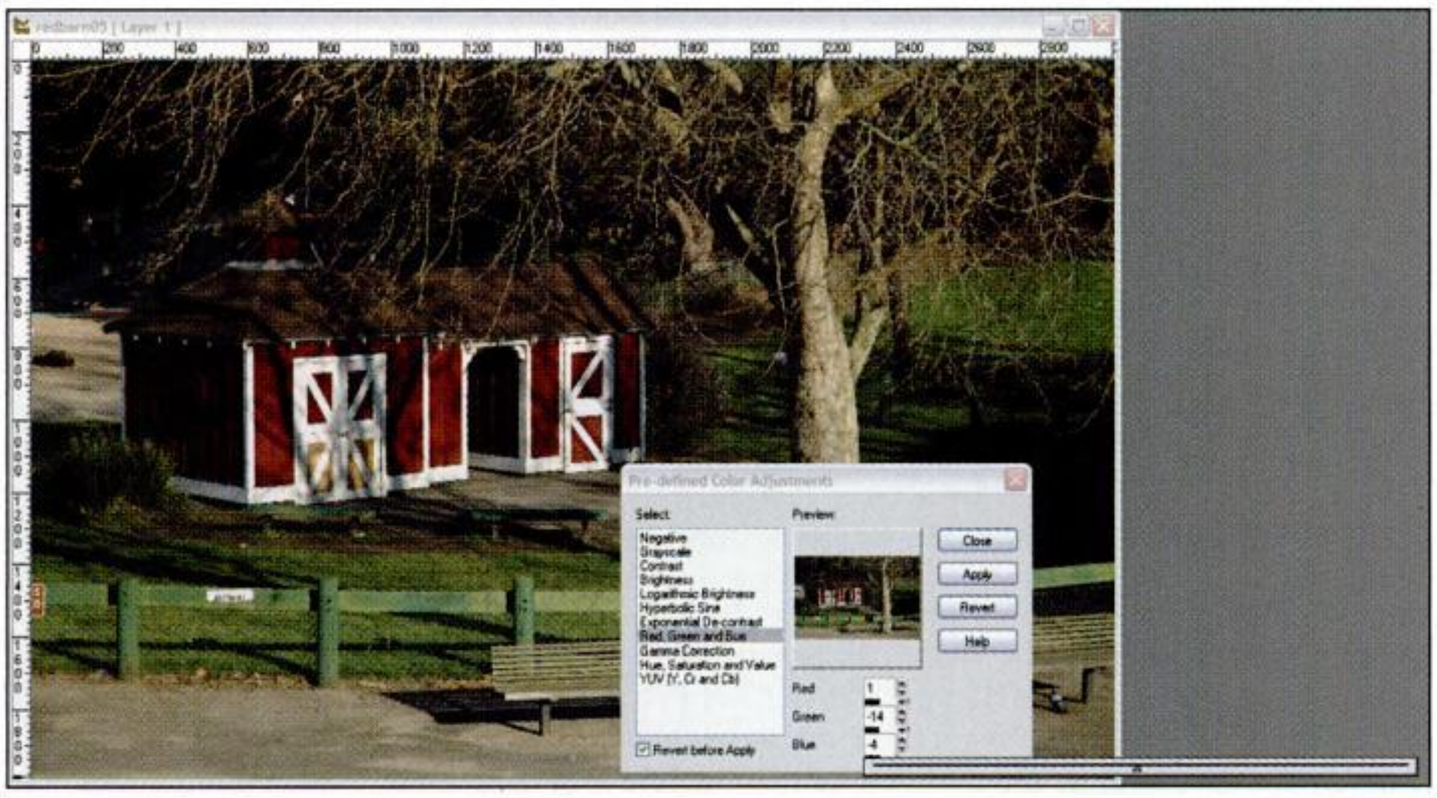


Fixing underexposed images is simple using *LView's* Histogram tool.

Step 2—Fix Funky Color

To fix an off-color image, select Color > Adjustments. In the resulting window, select Red, Green, and Blue to display the RGB slider controls. Which slider or sliders you use depends on what colors you're trying to alter. The Red slider alters cyan (move left) and red (move right), the Green slider alters magenta (move left) and green (move right), and the Blue slider alters yellow (move left) and blue (move right).

To fix, say, a green-tinged image (like our example at right), click the



It doesn't happen often, but if you accidentally take an off-color image, you can easily fix it by toning down the offending colors manually.

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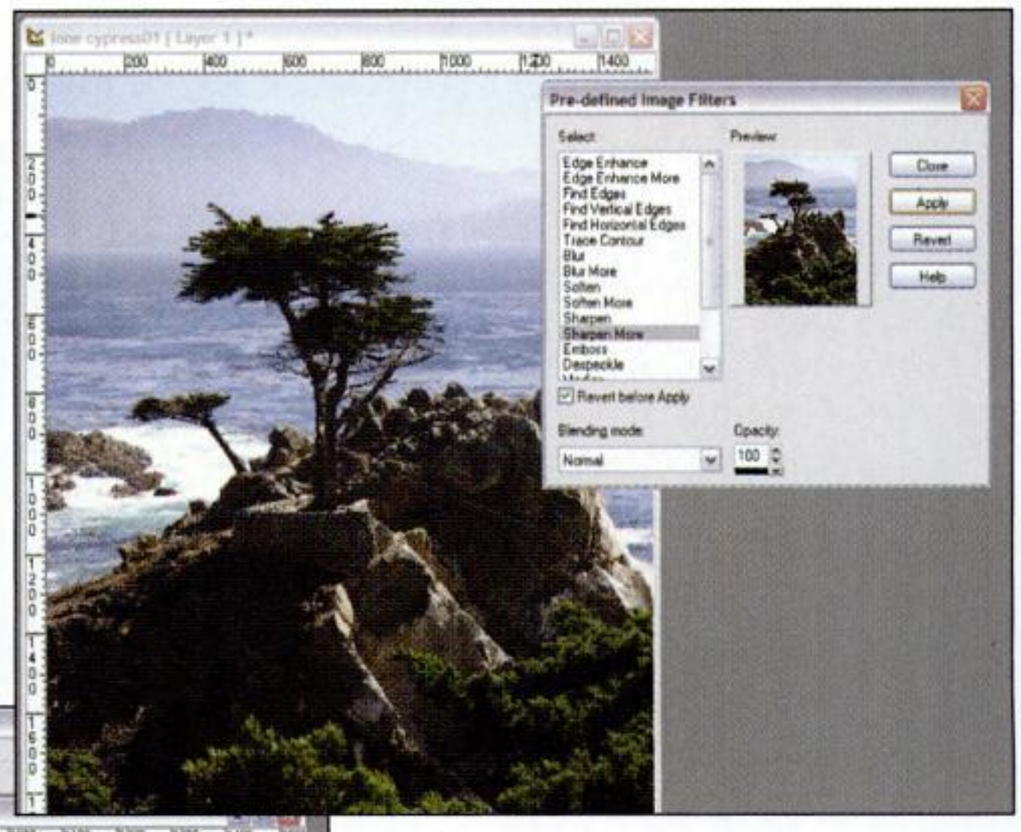
Green slider button to display the slider and move the nubbin left until things look better in the Preview window. Click Apply to view the change on your real image. Continue in this manner with other sliders (if needed). To fine-tune changes, use any color's up or down arrow buttons. Once your color looks right, click Close.



Sometimes fuzzy images are a good thing, but most images can use a little sharpening. To fix up blurry images, use the Sharpen filter.

Step 3—Sharpen the Fuzz

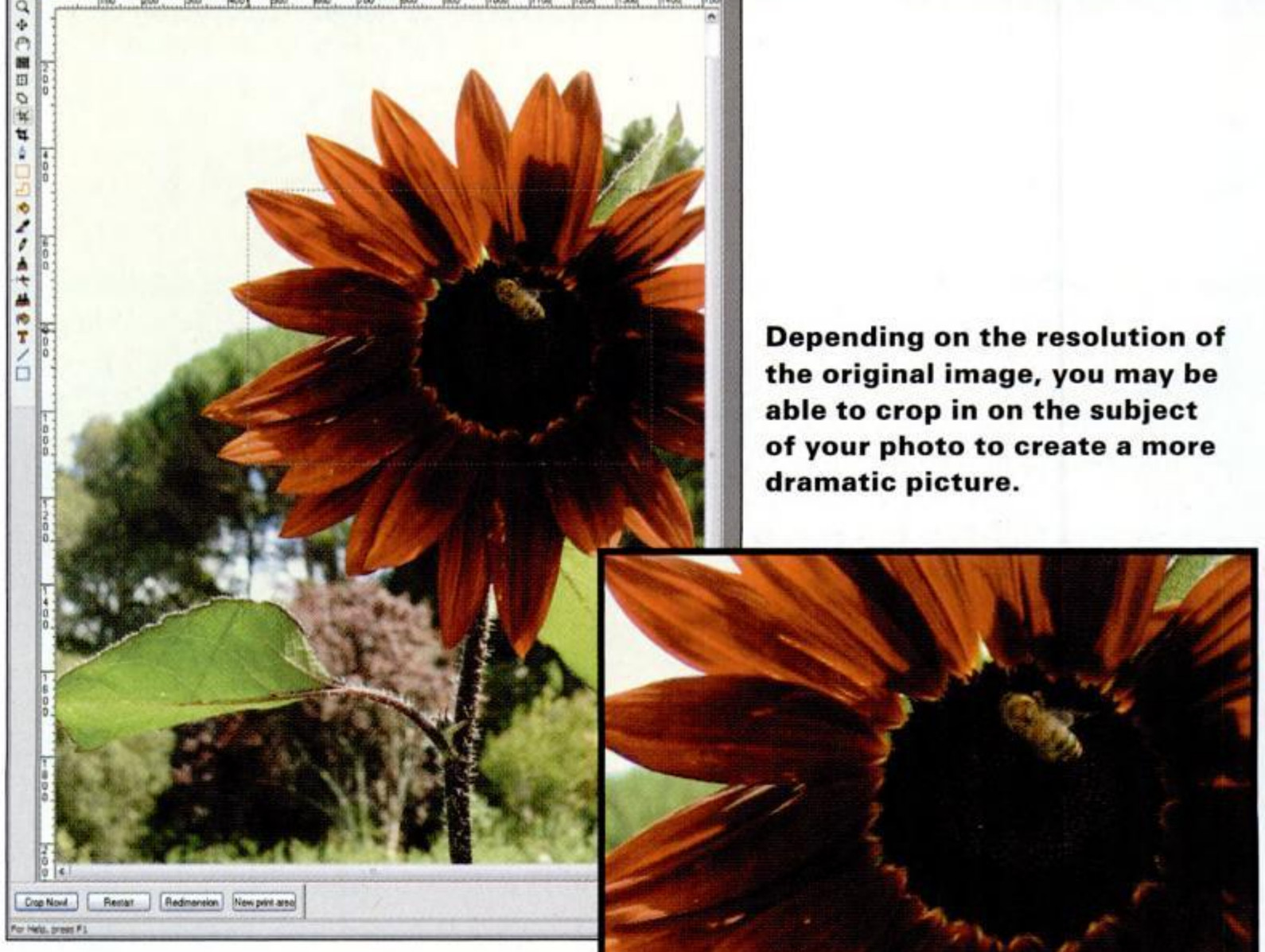
All images benefit from a little sharpening. You can greatly improve fuzzy images and boost the detail in images you're already satisfied with. To sharpen blurry images, select Color > Filters to open the Image Filters window.

If your image looks pretty good, select Sharpen for basic, light sharpening, and click Apply. If an image is slightly blurry, select Sharpen More, and click Apply. If your image is more than a little blurry, select Edge Enhance; if it's extremely blurry, select Edge Enhance More—or bail on the mess and call it art. Then click Close.

Step 4—Crop in on Details

If you want to remove unwanted perimeter obstructions or reframe your composition, use the crop feature. You can also use this feature to fake a longer zoom on an otherwise faraway subject if you've got a very high-resolution image.

To crop an image, select the Simple Crop tool and draw a marquee around the area you wish to keep. Resize and move the box as needed, and then click Crop Now! at the bottom of the screen. Keep in mind that you can crop out as much as 75 percent of a 3-megapixel image and still print a photo-quality 4x6-inch print, while a 6-megapixel image will yield a 5x7 with the same amount of cropping.



Depending on the resolution of the original image, you may be able to crop in on the subject of your photo to create a more dramatic picture.

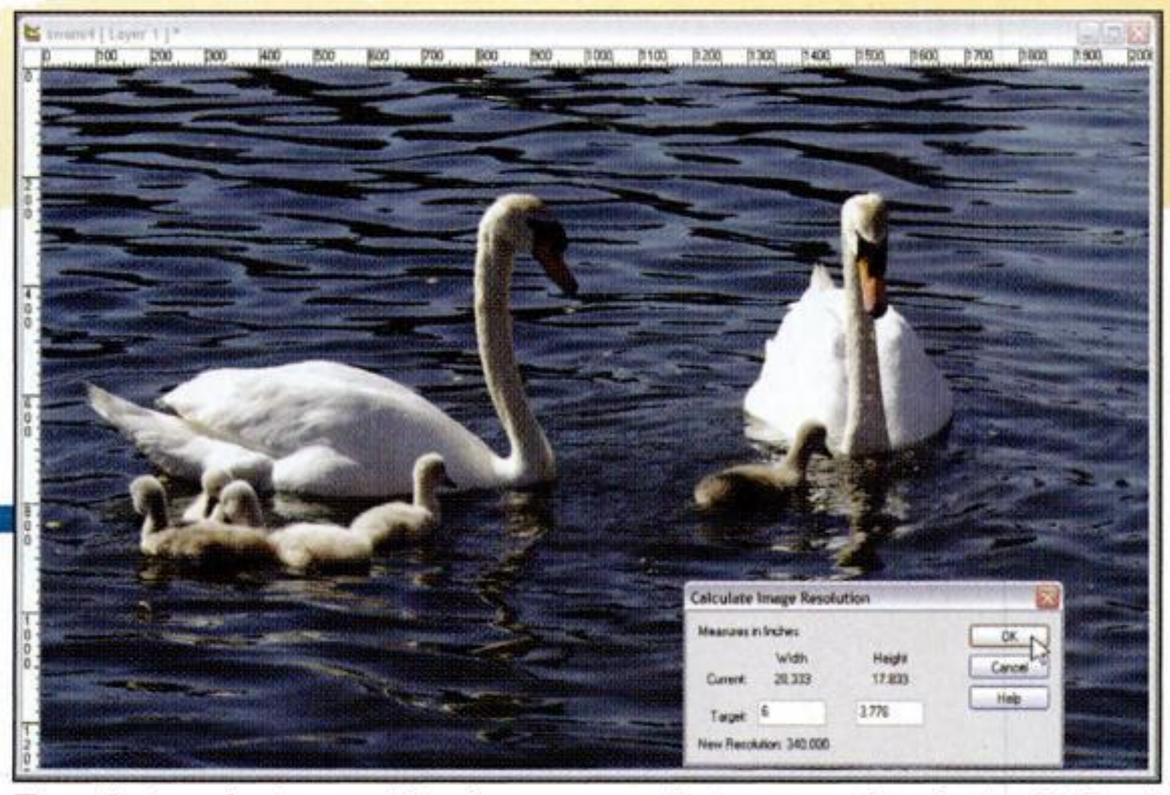
Print Perfect Pics

Printing pics may seem simple enough—heck, you just press Control-P, right? And then you blame your printer for your crappy results. No more excuses. Here's how to get perfect prints every time.

Step 1—Resize Your Image

Unless you're shooting with a high-megapixel camera, your images most likely have a default 72ppi (pixels per inch) resolution—far from photo-quality when printed. To get photo-quality, your image needs at least a 200ppi resolution.

To change the resolution and resize your image for the paper at hand, select Image > Resolution



To print a photo-quality image, a printer must be fed a 200ppi-or-greater source image! If you want your pics to look their best, you need to up the resolution yourself!

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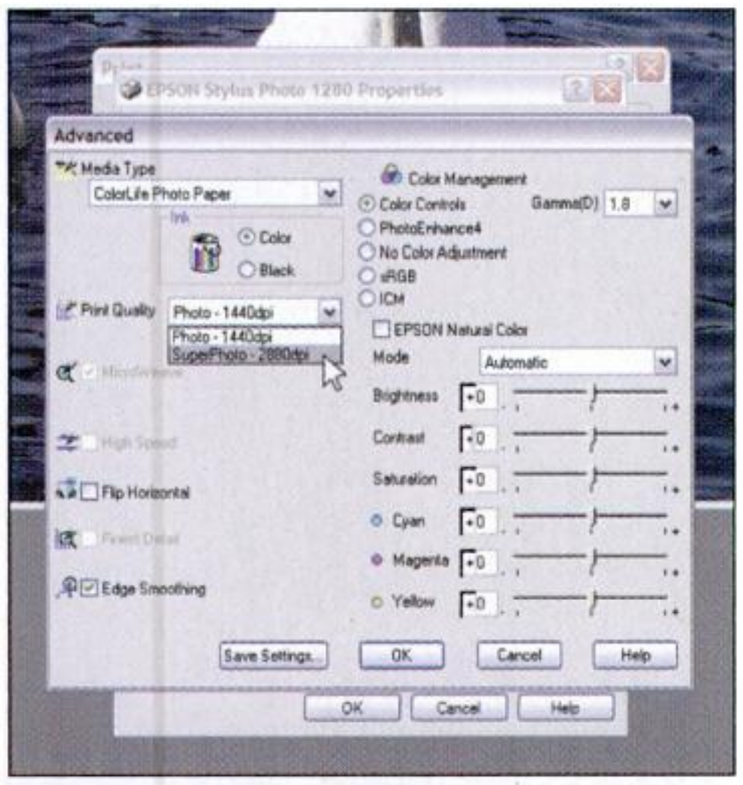


Using your printer's highest resolution may take slightly more ink, but your images will be indistinguishable from photomat prints.

to open a window. Click "Calculate for Physical Dimensions" to open another window. Then type a new width or height number in the respective field that corresponds with your paper—the opposite dimension and resolution will change accordingly to keep the proportions. Click OK in both windows to close them.

Step 2—Command the Highest Resolution

Select File > Print (or Control-P) and in the resulting Print window, click Properties to open your printer driver dialog. Printer dialogs vary—we're using an Epson; if you're using something else, apply our instructions to your printer. Click the Main tab and choose your paper type from the Media Type list—be sure to use high-quality photo paper, preferably from the same manufacturer as your printer. Under Ink, choose Color. Under Mode, choose Custom, and then click Advanced. In the resulting window, select your printer's highest resolution from the Print Quality drop-down menu. If you're using an Epson, choose No Color Adjustment under Color Management. Then click OK.

Step 3—Alert the Media

Click the Paper tab and select your paper size from the Paper Size drop-down menu. Under Orientation, choose Portrait (for a vertically-oriented image) or Landscape (for a horizontal one). Most photo printers vary the amount of ink used on normal paper and photo stock. Once you've done that, click OK to close the printer dialog, and then click OK in the Print window to print. ■

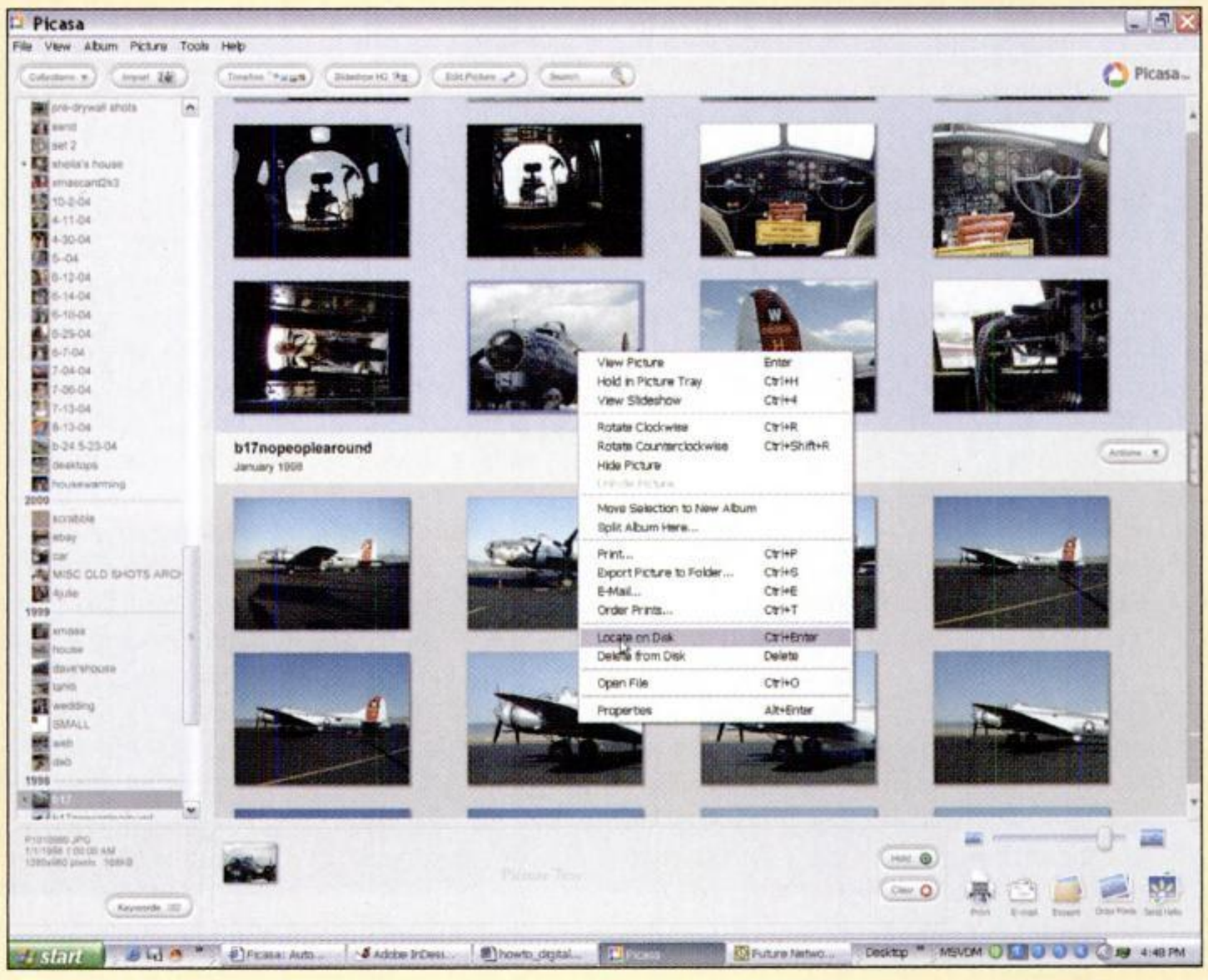
We're on the home stretch now! Make sure you choose the proper paper size and type before you press OK on that final print dialog.

TAKE CONTROL OF YOUR PHOTO COLLECTION!

Sure, digital photography is cool and all, but after just a few short weeks with your camera, your hard drive might resemble your college dorm room or bachelor (or bachelorette) pad—messy! It's important to establish a strategy for organizing your digital pics right away, and a variety of retail software is available to lend a helping hand. We, however, like free things, and there's no better free photo-management app out there than *Picasa*, which you can download from Google (and version 1.6 is on this issue's disc!).

After you install and launch the program, you can elect to have it search your entire hard drive for pics, which the program will catalog for you—it takes a while if you've got a lot of pictures, but this only needs to be done once. From this point on, when *Picasa* launches, it will scan only selected folders for new pics, which it will add to the catalog. You can control thumbnail size with a slider, view selected images as slideshows—with an accompanying MP3 track if you wish—and create albums and even web-ready photo albums. *Picasa* also includes a built-in email client, and you can send pics to your friends with just three clicks of the mouse.

Picasa falls short in the image-editing department, offering only extremely basic tools for cropping and enhancing your pics—but what do you expect for free? Paired with *LView Pro 2004*, *Picasa* provides the roundhouse in an effective one-two combo for editing and tracking your burgeoning picture collection.



***Picasa* takes the sweat out of cataloging your digital pics, and makes it easy to find individual pics on your hard drive.**

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How To...

A step-by-step guide to tweaking your PC Experience

Rip MP3s CD-Quality with One Click

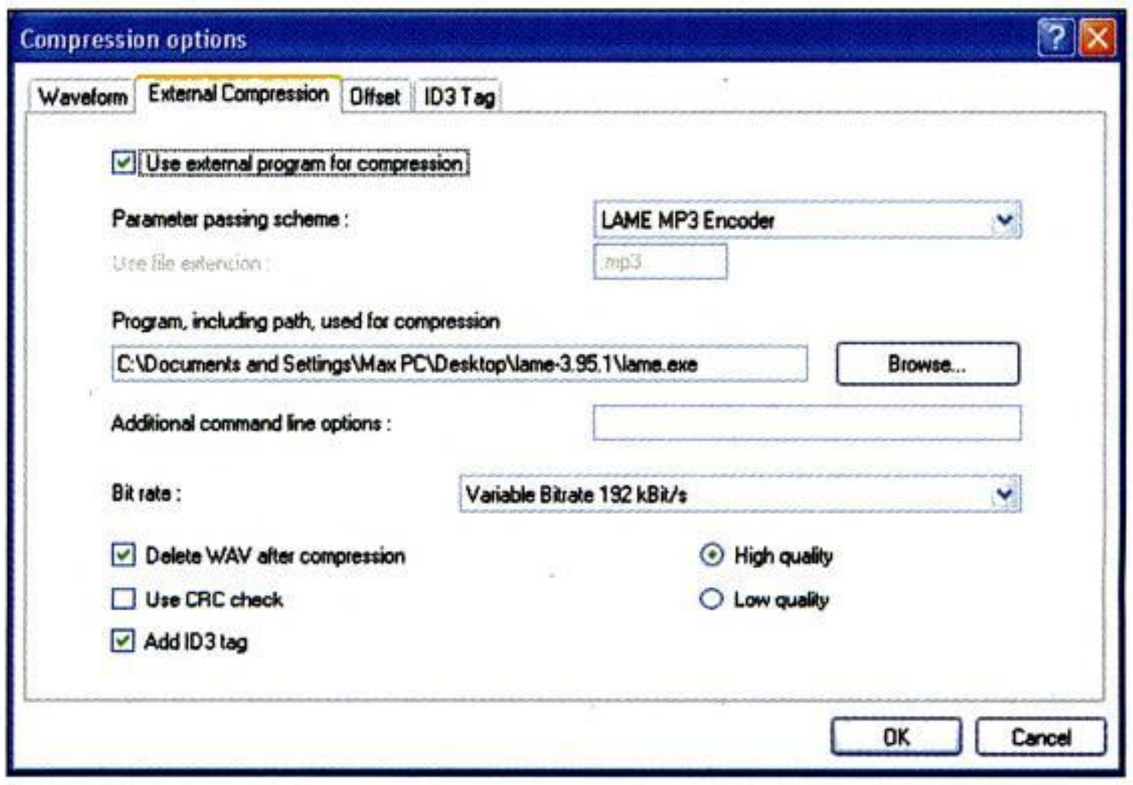
MAXIMUM PC
TIME TO COMPLETION
00:45
HOURS MINUTES

Even if you're happy with your MP3 collection, Maximum PC begs you to try this method——your ears will thank us

If you want a maintenance-free MP3 collection that sounds as good on your portable player as it does on your uppity home audio system, we've got the solution—and it's free! (The software, that is—not the music.) The secret lies in three components:

- A ripper that won't let bad extractions through the gate.
- A sophisticated MP3 encoder that delivers sparkling audio at reasonable file sizes.
- A process that isn't a chore to complete.

We engineered a process that automatically looks up your CD information on **freedb.org** after you insert the CD, and with a single click will rip the contents; compress the music using the *LAME* encoder; name, number, and tag the tracks for you; create folders for artist and album; and neatly tuck each track into the album folder. Grab your CDs, and let's get started.



In the External Compression dialog box, note that you can elect to have Exact Audio Copy delete the WAV files after converting them to MP3.

Download EAC and the LAME Encoder

If you want spectacular rips from your CD collection without having to worry about reviewing every track for flaws, you need *Exact Audio Copy*—download it at **www.exactaudiocopy.de,** and don't forget to send the author a postcard! Unlike other ripping apps, EAC double-checks every bit for accuracy against the original; if it finds discrepancies, it reads the data again, and yet again if necessary. As a result, it's intrinsically slower than other rippers, but with the automated process we're about to show you, it doesn't matter. You'll also need the *LAME* encoder, which has long been acknowledged as the finest MP3 encoder available, and it's free to boot. The current version at press time is 3.95.1 and you can download it at **http://mitiok.cjb.net/** (if the server is down, just Google "LAME encoder" for an alternative site). Unzip both applications into the same directory.

Configure EAC

EAC is extremely friendly to power-users, and offers oodles of control over the ripping process. This means the initial configuration can be overwhelming. But don't sweat it—here's our tab-by-tab configuration guide. Change only the following settings.

- On first launch, *EAC* will perform an initial drive test. When asked, select Optimization for "accurate results." You'll need an audio CD handy to allow the program to test your drive's error-correcting capabilities. If you have multiple optical drives, *EAC* will default to what it considers to be the best drive, though you have the option of changing this in the Options menu. *EAC* also graciously offers to configure *LAME* parameters for you. It will begin to search your drive for the *LAME* executable. Trust us, it's much faster to cancel the search and point *EAC* to the executable yourself. When asked, select the "standard" *LAME* setting option—for now. Finally, choose the Expert interface option, because that's where the action is these days. Now we're ready for some fine-tuning.
- From the EAC > EAC Options menu, select the General tab, and check "On unknown CDs," then click the "Automatically access online freedb database" radio button.
- Now select the Filename tab, and under Naming scheme, carefully type %A\%C\%N - %T (including the space before the %T tag). This will result in a directory structure that creates a folder from the artist name, a subfolder with the album name, and numbered tracks within the album folder, like this: Yma Sumac > Mambo > 04 – Chicken Talk. You can't designate an exact position (using C:\, for example); you'll get to specify your music directory in the next step.
- Select the Directories tab, and then choose "Use this directory." Point *EAC* to the folder you want to store your music in.

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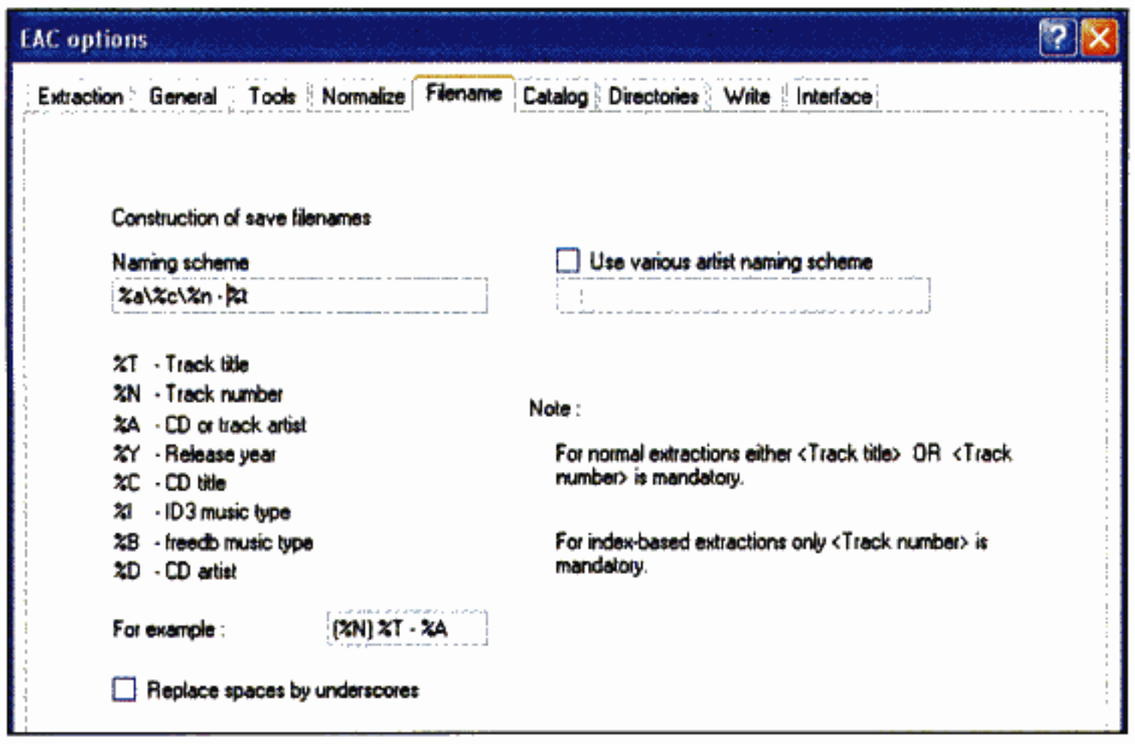
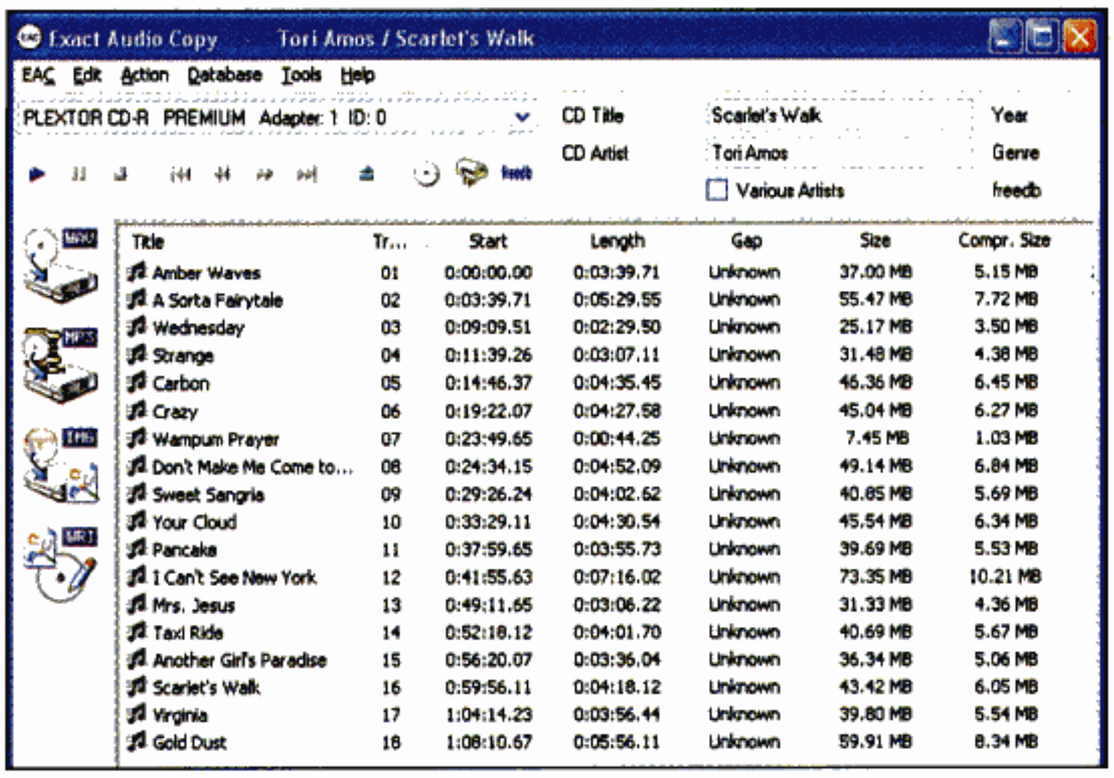


The Filename dialog box lets you assign metadata to folders by following the field with a backslash; "%C\" creates a folder with the CD title and stuffs your tracks into it.



***Exact Audio Copy* uses the freedb.org online database to automatically fill in disc data.**

▶ Go to the EAC > Drive Options menu. The box marked "Drive is capable of retrieving C2 error information" might already be checked. Leave it the way it is, but if, after ripping your first CD, you hear audible flaws in the tracks, it means your drive might not report error-correction information properly. If so, uncheck the box. Do not uncheck Secure mode—this is exactly what makes *EAC* special!

▶ Go to the EAC > Compression Options menu. Select the External Compression tab and make sure the *LAME* MP3 Encoder is displayed in the "Parameter passing scheme" pulldown box. If it isn't, select it.

▶ Go to the "Bit rate" pulldown menu, and select Variable Bitrate 192Kbps. We're happiest with variable bit rate encoding (VBR), which raises the bitrate during complex portions of music and lowers the bitrate during quiet or simple portions. But your MP3 player may not support VBR playback, or your disk space might be limited. In the former situation, you'll still get fine results with constant bitrate (CBR) encoding at a minimum of 192Kbps. In the latter situation, drop down to as low as you can stomach; 128Kbps CBR, for example, is okay if you listen to your music through cheap earbuds at the gym. But aren't we looking for the *perfect-sounding* MP3?

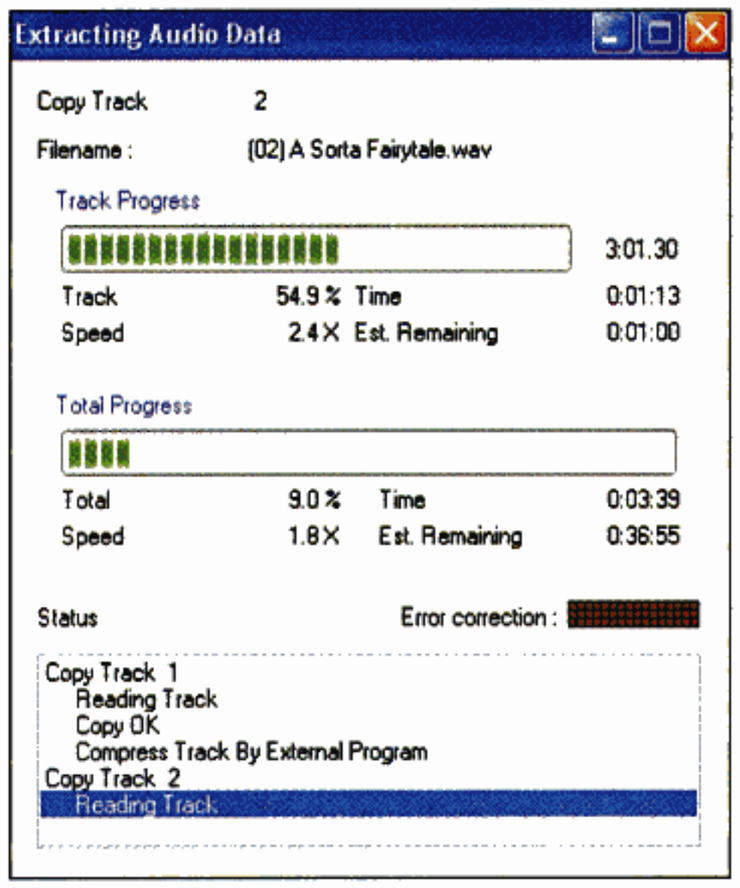
▶ Go to the EAC > freedb Options menu. Confirm that your e-mail address is correct in the e-mail field, and click the "Get active freedb server list" button.

Test Run

Wow! Thank heavens you only have to go through that process once. Now we're ready to make sure all our settings are correct before happily ripping away. Put an audio CD in the drive. EAC should automatically query the freedb server for track data. Annoyingly, it's sometimes reluctant to do so. If this happens, just press Alt-G.

Now click the MP3 button on the taskbar to the far left. Remember, *EAC* is not a fast worker. It's not supposed to be—it's a careful one instead. Depending on the condition of your CD and the accuracy of your drive, the ripping process could take a while. When the test run is finished, review your tracks. If they are blank or there are any errors, shout out "D'oh!", then double-check the settings above. If the settings look good, try downloading the *Nero* ASPI layer at **ftp://ftp6.nero.com/wnaspi32.dll** (your PC can't rip music without an ASPI layer). Put it in the same directory as *EAC* and try the test again.

You can get troubleshooting help from the forums at the EAC web site, or check out Chris Myden's spectacular exploration of the program's options at his site, **www.chrismyden.com**. (From the home page, click "Elite DAE" from the column on the left side of the page.) ■



***Exact Audio Copy* is not speedy, but it's still the most sophisticated and effective ripper we've ever used. And it's free!**

Burn CDs Flawlessly—Every Time

Despite the best efforts of the music industry, producing *perfect-*sounding burned CDs has never been easier. Here's some simple advice for good results every time.

▶ Don't burn audio CDs at rates higher than 24x. Due to the unique error-correcting scheme used by audio CDs, faster recording leads to more errors and gradual loss of fidelity.

▶ Don't burn at greater than 4x to avoid compatibility problems with fussy car audio systems.

▶ Always use brand-name media; at the very least, higher-quality media will extend the life of your disc.

▶ For higher compatibility with consumer electronics equipment, always "finalize" your disc (check your software documentation to find out where this option is).

▶ Always record in Disc-at-Once mode (instead of Track-at-Once)

▶ If you are recording a live show or a disc with songs that cross-fade, make sure to eliminate the pauses between tracks if your burning software allows it.

▶ If you are making a "mix" CD, make sure to normalize the volume levels from track to track. Some recording software includes this feature, or you can do it yourself (and get better results) with *MP3Gain*, available for free at **www.geocities.com/mp3gain.**

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How To...

A step-by-step guide to tweaking your PC Experience

Make MP3s From Your DVDs

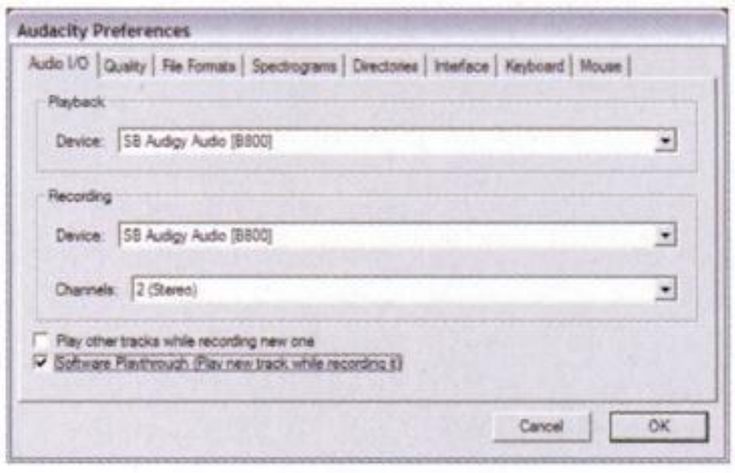
It's easy, free... and still legal!

DVDs aren't just for the living room anymore. Why not create MP3s from that *Yngwie Malmsteen —Live!* DVD so you can play air guitar in your bedroom when no one's looking? Or listen to *My Dinner With Andre* on your iPod so you don't have to actually look at Andre for two hours? Better yet, clip out sound bites from *Hedwig and the Angry Inch* and make your own bitter glam rock diva soundboard! The fun never stops, and all you need to get a piece of the action is your PC. We're going to walk you through each step of the process, and we promise it will be painless.

1 If you don't already have an audio recording application installed on your PC, download *Audacity* at http://audacity.sourceforge.net/. In fact, even if you *do* already have an audio recording app, we recommend you give *Audacity* a try. This free, open-source, cross-platform application is incredibly easy to use, and offers a huge number of sophisticated effects you can experiment with later. While you're at it, download the latest LAME MP3 encoder as well from http://mitiok.free.fr/. It's a high-quality, free MP3 encoder that works well with *Audacity*.

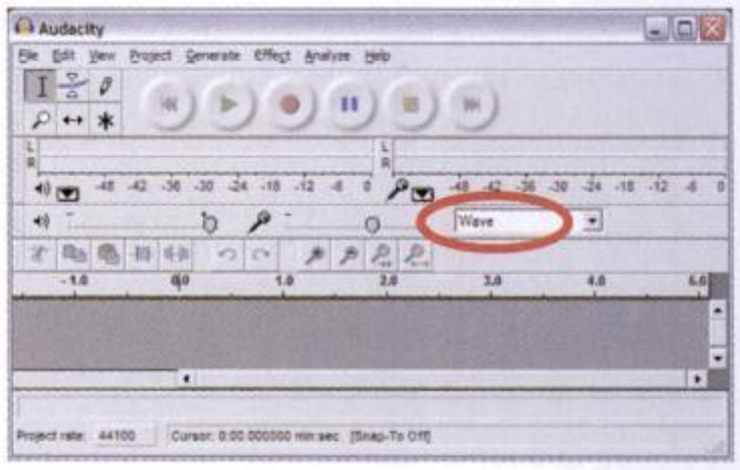
2 Install *Audacity*. Extract the contents of the LAME encoder zip folder you downloaded to a temporary directory. Locate the lame_enc.dll file and move it to the directory you installed *Audacity* in (this DLL is the only file you'll need from the LAME package, so you can trash the temp folder).

3 Launch *Audacity*. Before you begin recording, you need to do some basic configuration first. Go to File > Preferences and click on the Audio I/O tab. This is where you tell *Audacity* what hardware to use for playback and recording. We're using our Sound Blaster sound card to record and play back audio, so we've selected SB Audigy Audio from the drop-down lists under Playback and Recording. From the Channels drop-down list, select 2 (Stereo).



4 Now click on the File Formats tab. Under MP3 Export Setup, click the Find Library button. Click Yes in the dialog box asking you to locate the LAME encoder, and then navigate to the *Audacity* directory, select the lame_enc.dll file, and click on Open. Use the Bit Rate drop-down menu to select your bitrate. If you're ripping audio from your DVD for the music and want good fidelity, we recommend at least 192Kbps. But if you just want to listen to *The Big Lebowski* during your commute ("That rug really pulled the room together, man!"), you can get away with as little as 64Kbps. Click on OK to finish the configuration process.

5 Now we're back in the main application window. Access the drop-down menu circled in the screenshot and select Wave from the list. This tells *Audacity* that you want to record the WAV audio directly from our sound card.



6 Next, make sure you've got enough room on your hard drive to store your recording. *Audacity* records audio to a temporary uncompressed audio file, and uncompressed audio takes a huge amount of hard drive space. As a rule of thumb, each minute of recording scarfs about 20MB of storage. During playback, *Audacity* will periodically report on how much recording time you have left in a small strip near the bottom of the window. If you have another drive with more space, you can tell *Audacity* to place its temp file there by going to File > Preferences and clicking on the Directories tab.

Fun fact:

"LAME" is an acronym for "LAME Ain't an MP3 Encoder." Of course, it *is* an MP3 encoder. Long story.

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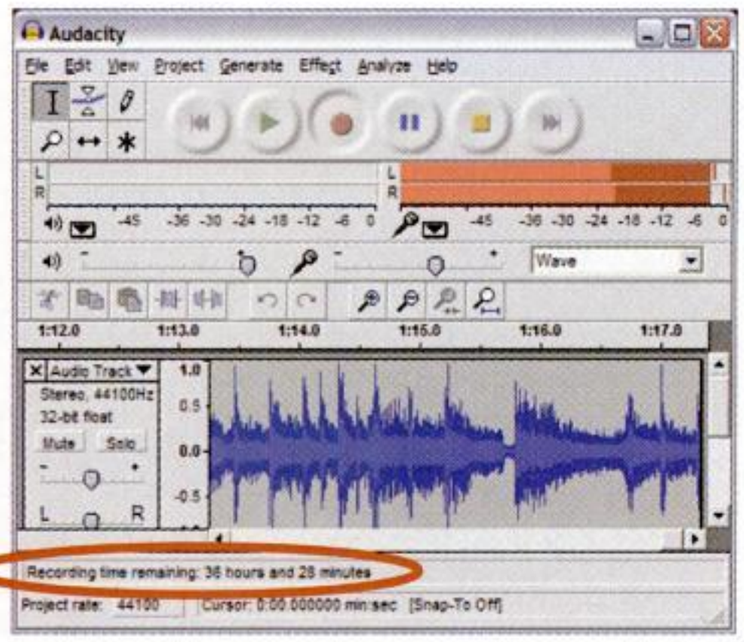


7 Now it's time for a test run. Drop the DVD you want to record into your DVD-ROM and launch your DVD player. If you've already watched the DVD you're recording, skip ahead to the loudest scene—this will help you adjust the recording level to minimize distortion. While the scene is playing, click on the red record button at the top of the window (it looks greyed out, but that's just a poor design decision). You should now see red bars indicating that a signal is being recorded. Watch the bars as the DVD plays, and adjust the input volume slider (next to the microphone icon beneath the meter) until the red bars approach the far right edge of the meter ("0") but do not touch it. If the peak level is too high, you'll get distortion. If it's too low, you'll get "hiss."

8 If you're not getting a signal, go to the Sound control panel (Start > Control Panel > Sounds and Audio Devices). In the Device Volume panel, click on Advanced. You'll get the volume adjustment control panel, where you'll want to make sure that the Wave volume slider is at least three-quarters of the way up and not muted. If you can hear the DVD playback through your speakers but still aren't getting any signal, go back to the *Audacity* drop-down menu from step 3 and look for an option to record the signal sent directly to the speakers; if you've got a Sound Blaster soundcard, that option will be "What U Hear." Be aware that this setting will also record any system sounds (such as mouse clicks), so don't use your PC during the recording process.

Fun fact:

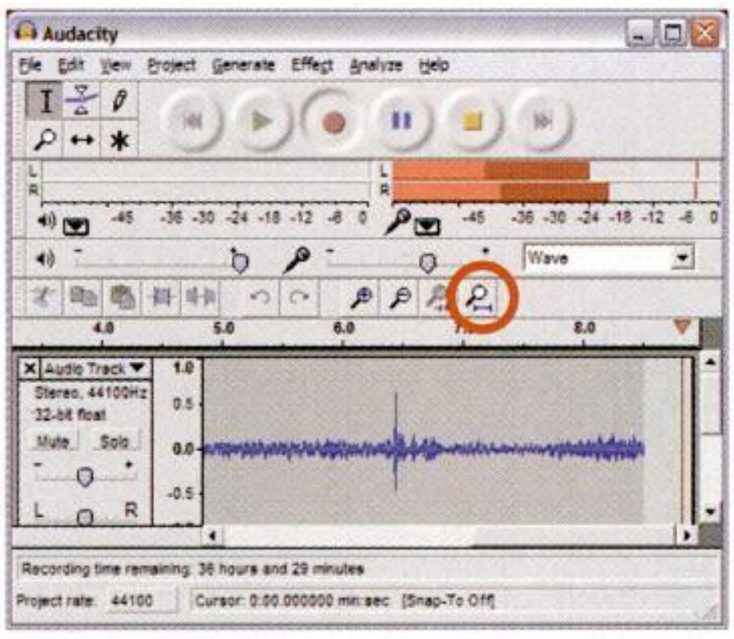
If you look at the directory structure of a DVD-Video disc, you'll notice two folders called VIDEO_TS and AUDIO_TS. AUDIO_TS does *not* contain the disc's audio information. The folder is intended for the high-definition DVD-Audio format, which nobody seems to care about.

9 Finally, close down all applications running in the background, especially ones that frequently access the hard drive (that means no file-sharing funny business in the background while recording, OK?).

10 Restart the DVD and let it run through any introductory screens (such as those tedious FBI and Interpol warnings). Hit the record button, kick back and enjoy the show. Press the square yellow stop button when the DVD is finished.

11 If you're OK with a single, continuous MP3 file, skip to step 13. But if you want to split up the file into chapters, or if you want to isolate and clip out portions (such as individual songs), first go to File > Export as WAV and save the track to whatever directory you prefer. You *do not* want to export the recording to MP3 yet, because you'll end up clipping out portions and having to export them to MP3 again, which will recompress the files and result in signal degradation.

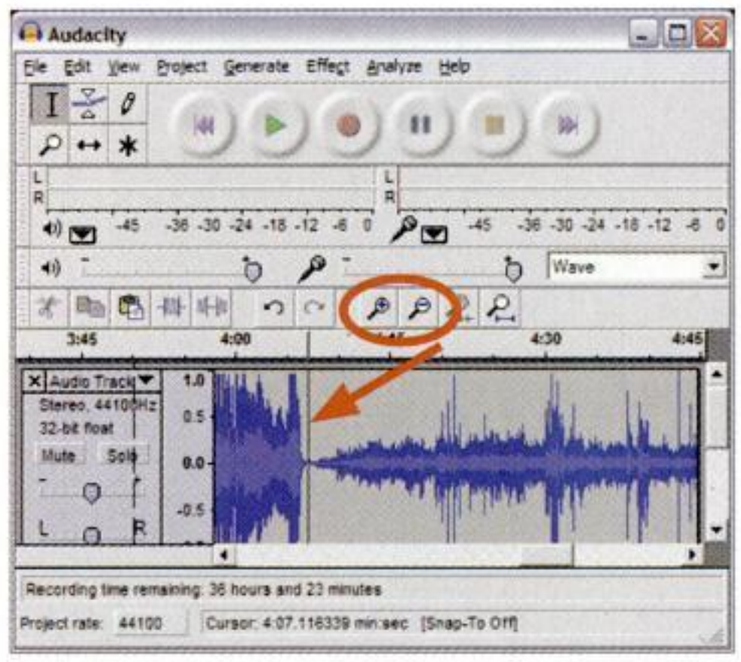
12 If you simply want to split up your track into "chapters" of roughly equal length, click on the Fit Project in Window button (circled). This will place the visual representation of your entire track in the



track window. When your mouse is in the track window, it turns into an I-beam cursor. Use this cursor to select the portion of the track you want to make a single file of (hint: the easiest method is to place the cursor at the *end* point of your selection, and drag to the left to the beginning of the file). Select Edit > Cut (or press Ctrl-X) to snip out this portion. Go to File > New, and a new *Audacity* window will open up. In the new window, select Edit > Paste (or Ctrl-V).

13 Now that we've got the track ready for conversion, simply go to File > Export as MP3. Tell *Audacity* where you want to drop the MP3 and click on Save. Next, you'll be offered the opportunity to add ID3 tags. When you click on OK, the file will be converted to MP3. Repeat this process for the rest of your tracks.

14 If you want to cut out and make MP3s of only specific portions of the track (such as individual songs), you'll need to locate these portions. If the tracks have silence between them, they're easy to



isolate—just scan the track window for areas with little or no signal, as shown in the picture above. Feel free to expand the application window to make this task easier. You can also use the zoom buttons (circled) to help you locate these points. Then simply select the beginning and end points, cut and paste the track into a new window, and export it to MP3. If there aren't obvious gaps between tracks (which is likely in live performances), you'll have to use the playback buttons at the top of the application window to help you find beginning and end points.

15 If you're feeling ambitious, explores *Audacity's* Effects menu to add equalization, cross-fade tracks and remove noise. Just make sure you experiment on a duplicate of the original file in case you don't like the results.

16 If you don't have a DVD-ROM in your PC, you can still record your DVDs by hooking up your set-top player to your soundcard with an RCA-to-1/4" jack cable. Just connect the RCA cable to your DVD player's RCA line-out connectors, and connect the 1/4" jack to the line-in jack on your soundcard. Most soundcards have a dedicated line-in jack, but you can use the microphone jack if yours does not. Then select Analog Mix from the drop-down list we used in step 3.

In case you were wondering, it's possible to "rip" the audio of your commercial DVDs digitally—and much faster—by using programs like *DVDDecrypter* (did we say that out loud?), but the complicated process involves digging into the cryptic DVD-Video file structure, and runs afoul of the Digital Millennium Copyright Act because you're cracking the CSS encryption to extract the contents. Our method does not. After all, who wants Interpol on their case? ■

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How To...

A step-by-step guide to tweaking your PC Experience

MAKE A KILLER HOME MOVIE WITH Movie Maker 2

MAXIMUM PC
TIME TO COMPLETION
02:30
HOURS MINUTES

What You'll Need

- A DV camera (optional)
- PapaJohn's tutorial files, which are on the CD that accompanies this magazine. Unzip them into a folder on your hard drive, load 'em up in WinXP as directed, and follow along!

Expert John "PapaJohn" Buechler shows you how to get the most out of WinXP's capable video-editing tools

It's likely that you own a digital-video (DV) camera, and it's equally likely that you've got scads of video either on your hard drive or stored on tape that you may not know quite what to do with. Dropping rough video files onto a DVD and popping it into your player for the family to watch may be easy enough to do—but does anyone really enjoy the fruits of your efforts?

To really wow your audience and keep 'em clamoring for more, you're going to have to roll up those sleeves and do some editing, which can seem like a very daunting and time-intensive task—and it can be. However, it doesn't *need* to be. There are many excellent third-party video-editing software suites out there to help you, but choosing one is tough, the associated learning curves are typically pretty steep, and most may be more advanced than you need. Thankfully, there's no real need to go shopping just yet: Windows XP already includes what is perhaps the best software for you to cut your video-editing teeth with, *Movie Maker 2*.

We're going to show you how to transform that tape of "Jr.'s baptism" or "Susie and Paul's wedding reception" into a mind-bendingly polished movie that your friends and family will actually *want* to watch.

Video Editing 101: A Refresher

- Your **source files** are the video clips, still pictures, music, and sound files you select for your project.
- The **collections** of clips are pointers to your source files, used to study and subdivide the material as you get ready to start a movie project.
- The selected clips are dragged from the collections to the **storyboard** or **timeline** of the project, each of which represents different views of the same project.
- When finished with editing, you save the movie, **rendering** it to a video file.

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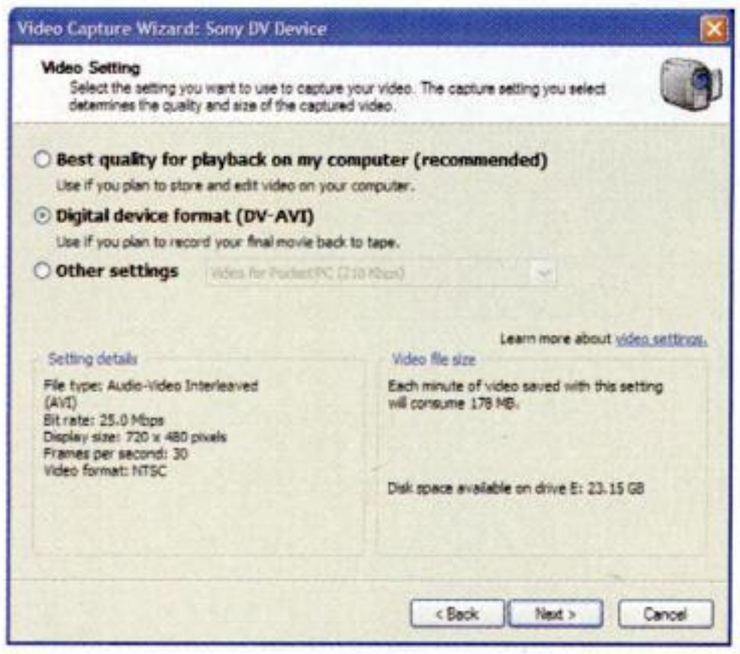

Figure 1 Select a quality setting. Digital device format (DV-AVI) is the logical one for this capture.

Figure 2 For part of a tape, use "Capture parts of the tape manually."

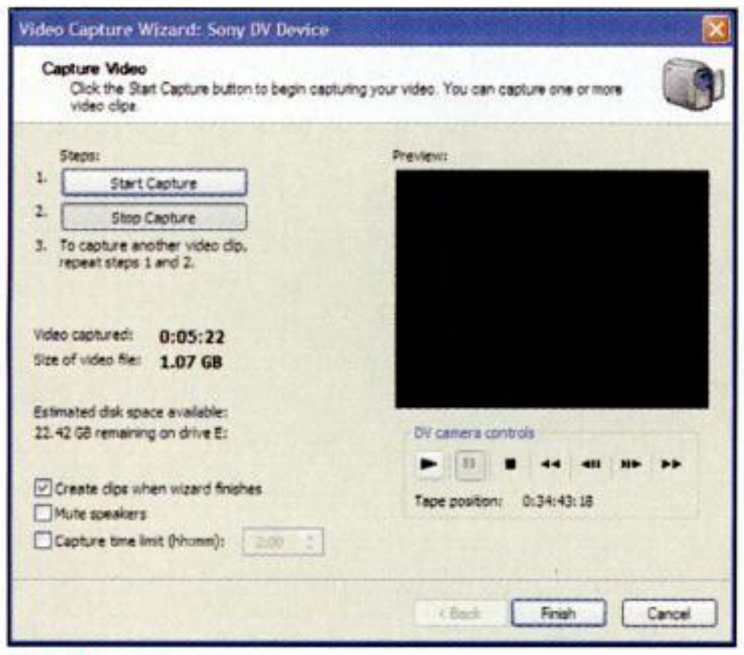

Figure 3 Use *MM2's* preview monitor to control the camcorder. Forward, pause, stop, reverse, or jog a frame at a time. Include some extra frames at both ends of the clip just for good measure.

Using a 5-1/2 minute video of a dance scene as an example, we'll walk you through every step needed to get your source material into *MM2*, study and work the clips in the collections, put them into the project, spice it with extras, and save the final movie for viewing. All source files for this example are included in the Zip file on this issue's CD. Use them to follow along.

To help you start, we did Step One and most of Step Two for you. We'll go over what we did, and you can pick it up at the point of importing the source files from the Zip package on the CD.

Step One: Review the Video Footage

Shooting the camcorder footage isn't part of this exercise, but here's a little background on where the source materials came from.

The dance scene is from a wedding reception. The lighting of a dance floor is often dark to dim at best, and this one was no exception. Two camcorders were used, and footage taken with a digital camcorder (Sony TRV80) isn't nearly as bright as that taken with an analog Hi8 (Sony TRV615). The digital camcorder was mounted on a tripod, aimed at the band on the relatively bright stage, turned on and left alone. It recorded whatever happened and is the source of the full audio track. The analog camcorder was handheld to easily move around the darker dance floor, turned on and off to capture select scenes.

You will mix the footage from the two camcorders and produce a killer home movie.

Step Two: Capture the Video

Getting digital camcorder footage into *MM2* is simple. For the highest quality, connect a firewire cable from the camcorder to your computer's firewire input, turn the camcorder on, and switch it to the VCR or VTR mode.

Windows XP and *MM2* will recognize the camcorder and be ready to capture video.

When *MM2* captures video from a camcorder, it uses a three-step process. It builds temporary files and copies the data from those files to the name and location you entered. When the file is complete, it deletes the temporary files and imports the final one into a new collection.

Getting analog camcorder footage is a bit more complicated, but just a bit. There are more choices. You can use an analog capture device or the "pass-through" feature in MM2 2.1, which is the latest version 2.1 of *MM2* and is included with SP2. Or you can do it like we did, dubbing the analog footage onto a digital camcorder tape by connecting the two camcorders using RCA and S-video cables.

DV-AVI files are large. An hour of video needs about 13GB of storage space. The two captured files for just this dance scene totaled about 2GB—too big to fit on the CD. We used *MM2* to convert them to smaller WMV files for the story, small enough to fit on the CD yet large enough for good-quality editing.

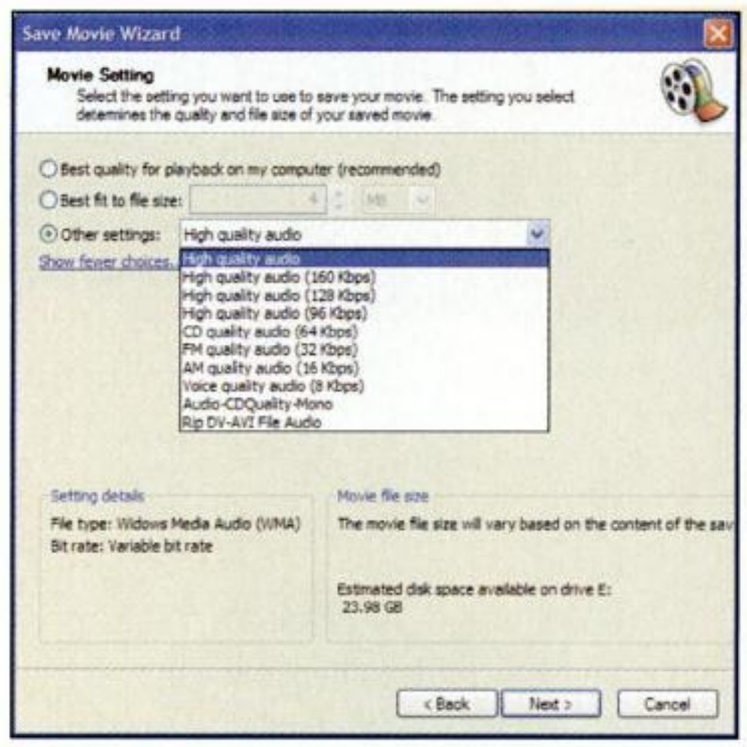

Figure 4 Select the quality option for the audio file.

MM2 has an option to automatically split the file into clips as it imports. For this exercise, uncheck the option and import each as a single large clip. You'll take full control of the clip splitting a bit later.

Check the captured footage for quality. *MM2* is entry-level video editing software. Most find it more than sufficient for their needs, but it lacks some features of higher-end software, such as providing automatic feedback about frames that are dropped during the capture process. Dropped frames are typically indicative of computer issues, such as a slow hard drive or a PC in need of a tune-up. Use *MM2's* Preview Monitor to view the imported file and check for missing frames or audio glitches.

Step Three: Rip the Audio Track from the Video File

There are a couple of ways to use the audio track from the camcorder footage. The easiest is to simply put a second copy of the video clip on the Audio/Music track and *MM2* will treat it as if it were audio-only.

Another is to rip it to a new file. If you're an audiophile, or have aspirations to be one, and you want to enhance the

DID YOU KNOW?

MM2 has a 15 frames-per-second working environment (12-1/2 if you're using the PAL option). When you move one frame, you're really moving two. This feature is one of the key technical reasons *MM2* can give you real-time previews of your developing project without having to render temporary files. The 15-fps working environment is sufficient for most projects.

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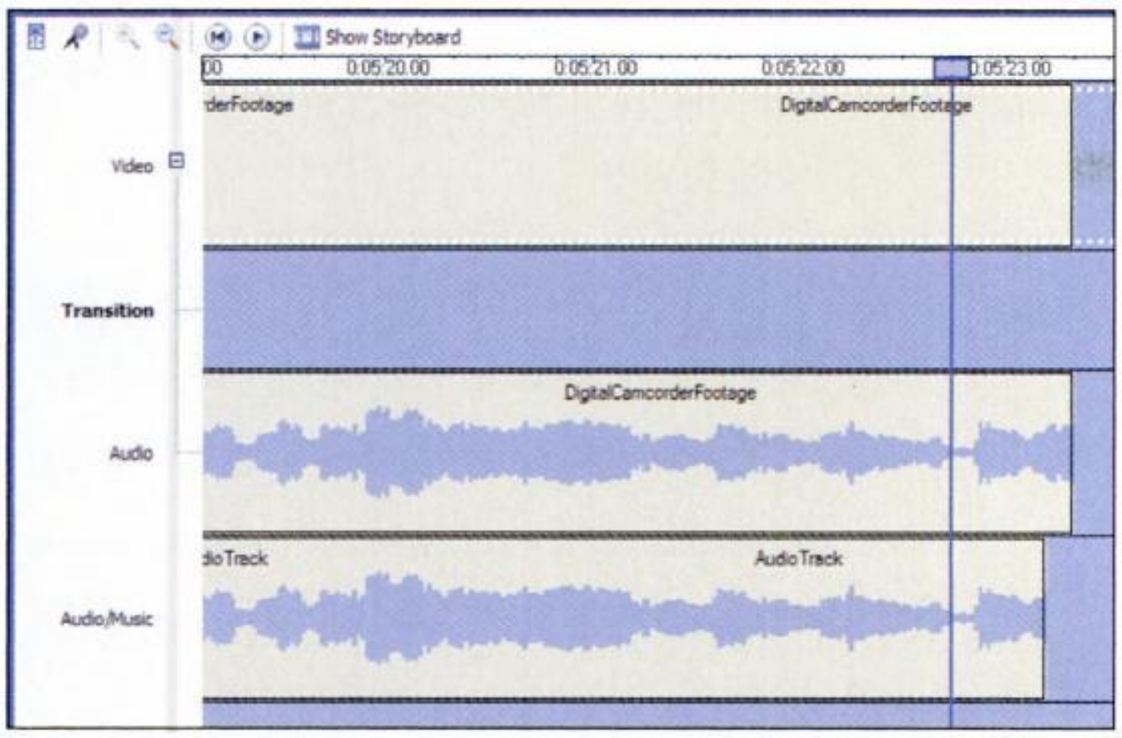

Figure 5 Synching audio clips to video clips can make or break a movie, so don't rush it.

audio using your favorite software, place the video clip on the Audio/Music track and save the movie. The wizard in *MM2* will see that it's audio, and present a different and appropriate set of audio quality options.

MM2 will render the audio to a Windows Media Audio (WMA) file, which we've already ripped for you: "AudioTrack.wma". Yes, you could use the second copy of the video file as we noted; we just thought it was a bit neater to have the audio track recorded as an audio track.

Audio plays a major role through all these editing sessions. Use what you hear and see in the wave patterns to keep the clips in sync with the audio track. Copy the "DigitalCamcorderF ootage" clip and the "AudioTrack" clip to the timeline and take a look at the wave patterns. To see them easier, grab the horizontal and vertical divider lines between window panes and drag them as needed. As the focus of the editing sessions changes, resize the working panes to keep things easy to see.

Zoom into the timeline to see a segment close-up, or zoom out for an overview. Different views are better during different parts of the project. See how the visual wave patterns of the two clips align perfectly? They should, as they both came from the same captured file.

The AudioTrack clip is your ruler through this project. It's the key to syncing the clips. You'll be trimming video clips, discarding some, moving or overlapping others, and bringing in new ones. Keep your eyes and ears on the audio patterns as you do.

Step Four: Use Your Stock Library to Add Energy

A few well-placed stock clips can add pizzazz to any project, especially in the opening and closing scenes. And other stock clips have specific, functional purposes. There's some of each type in the zip file on the CD (which you've downloaded and unzipped by now, right?).

The snazzy visualizations produced by *Windows Media Player*, *iTunes,* and Dell's *Jukebox* can be captured as video clips and used in movies. Use software such as *Windows Media Encoder* to capture it. Easier yet, put your camcorder on a tripod and zoom into them on an LCD screen.

We included a "Red-to-RedAndBlack" visualization clip to help with the opening, and a "GreenAndWhiteFireworks" clip for the ending. The fireworks clip needs appropriate sound, so there's an audio clip from a fireworks show included as well.

A two-second audio spot on the original digital footage isn't in good taste for some viewers, so we put a "bleep" audio sound effect from the library to squelch it. The "DigitalCamcorderFootage.wmv" file already has the bleep, so you don't need to go check it to see what was there. (Expletive deleted.) The bleep did the job without affecting the visual continuity.

Another functional clip is a plain black "blackness.jpg" picture. Use it to fill space on the video track as needed to maintain audio sync. On the timeline, grab it by the trim handle and make it any duration you need. Just be sure to use it only as a placeholder until you select the right video clip for that spot. *MM2* doesn't allow gaps in the video track of the timeline: Clips automatically "snug up" to the left if you delete one.

With the audio track, two video clips, and four stock clips, you have enough for the project. It's time to dig in.

Step Five: Time to Split Some Clips

Having skipped automatic clip-splitting during capture, make a first manual pass at it in the collection. Why split them in the collection? Many projects don't need to sync clips with footage from two camcorders recording at the same time, so you can typically go right to the storyboard/timeline. But this is *Maximum PC,* and we wanted to give you a challenge!

Figure 6 The seven starting clips for the project are set. Let's make a movie!

There are a few reasons to split clips in a collection rather than in the timeline. You can rename a clip in a collection but you can't on the timeline, and descriptive names are easier to use than "clip 1" or "clip 2." For syncing the visual/audio in the project, it helps to know the exact location of the clip in the bigger, original file it came from. And the "clip properties" data in the collection includes this information. On the timeline, the same clip's properties change to show just its location on the timeline.

And the best reason of all is to spend some time really getting to know each clip individually, which will result in a better final film. You'll love some, like some, and dislike many. You want only the good ones in the timeline.

Create two new collections, "Analog Clips" and "Digital Clips," and copy the two original source clips into them so you don't mix the smaller clips from the two as you split them.

Here are some guidelines for the first-pass splitting:

- Use the controls under the Preview Monitor to go one frame beyond your cut point. Then go back one frame and make the first split, forward again one frame into the second clip, and split it again. You'll have the first clip, a one-frame fragment, and the second clip.

- Look for places the camcorder was stopped and started. If the visual difference isn't enough, the audio will help, especially in a dance scene.

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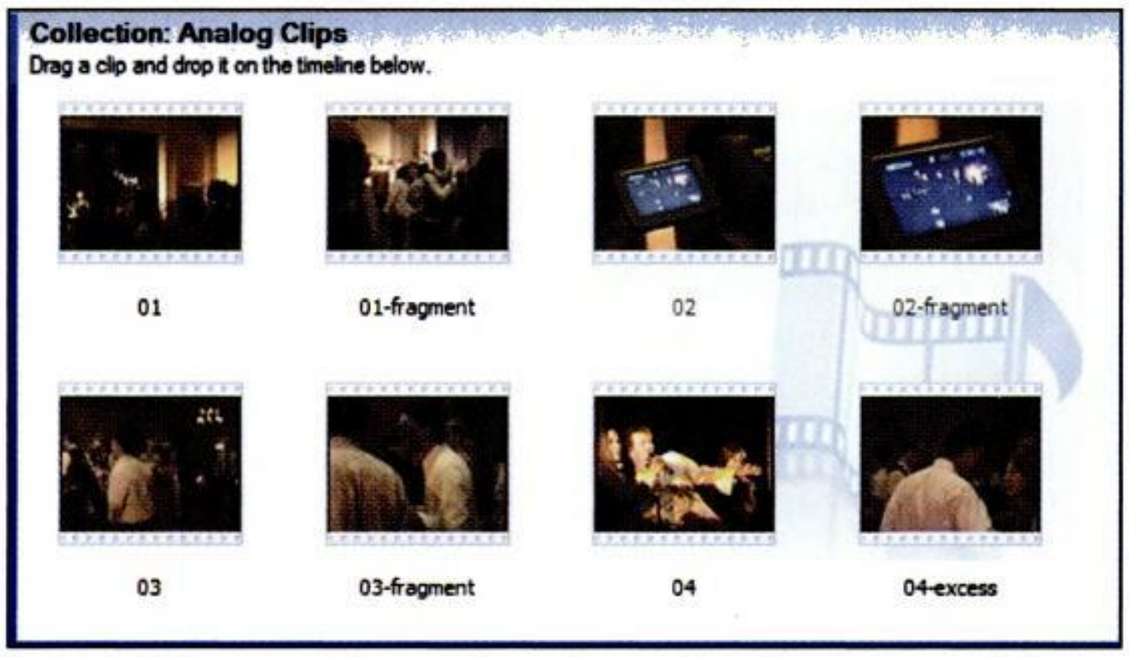

Figure 7 Here are the analog clips after first-pass splitting in Thumbnail view. Toggle from the Thumbnail to the List view. Each has its advantages.

Collection: Analog Clips

Drag a clip and drop it on the timeline below.

Name	Duration	Start Time	End Time
01	0:00:05	0:00:00	0:00:05
01-fragment	0:00:00	0:00:05	0:00:05
02	0:00:15	0:00:05	0:00:20
02-fragment	0:00:00	0:00:20	0:00:20
03	0:03:33	0:00:20	0:03:53
03-fragment	0:00:00	0:03:53	0:03:54
04	0:00:09	0:03:54	0:04:03
04-excess	0:00:08	0:04:03	0:04:10

Figure 8 Here are the same analog clips after first-pass splitting in Detail view.

• Rename the clips as you split them and be as descriptive as you can. Get a quick start by assigning them sequential numbers, but as soon as you have a better descriptive name, use it. Name fragments as "01-fragment," "02-fragment," etc. This first pass is analytical. The artistic pass is next.

Our first splitting session divided the original analog clip into eight smaller ones. Four had some good content, Three were just fragments, and one was the excess frames at the end of the dance scene. The extra frames were part of the next dance scene—just some of the cushioning you get when you shoot a bit of extra footage, which you should always try to do. As it turns out, they looked pretty good and we used them in the final video to help soften the phase-out at the end.

The digital camcorder wasn't stopped and started as it shot the stage during the dance. So it doesn't need any splitting in this first-pass.

You'll need to do more aggressive splitting in the second pass, but first make some notes about the alignment between the audio track ripped from the digital tape and the 4 clips from the analog camcorder. If syncing is important, note the relative position of the clip with the audio track. At this point, you're not using the timeline to build the final project—you're using it to assess the syncing relationships. Let's go through each of the four analog clips.

Analog Clip 01 is nothing more than 5-seconds of applause after the previous dance. A black image of 2 seconds duration on the video track bumps the clip out just enough to align it

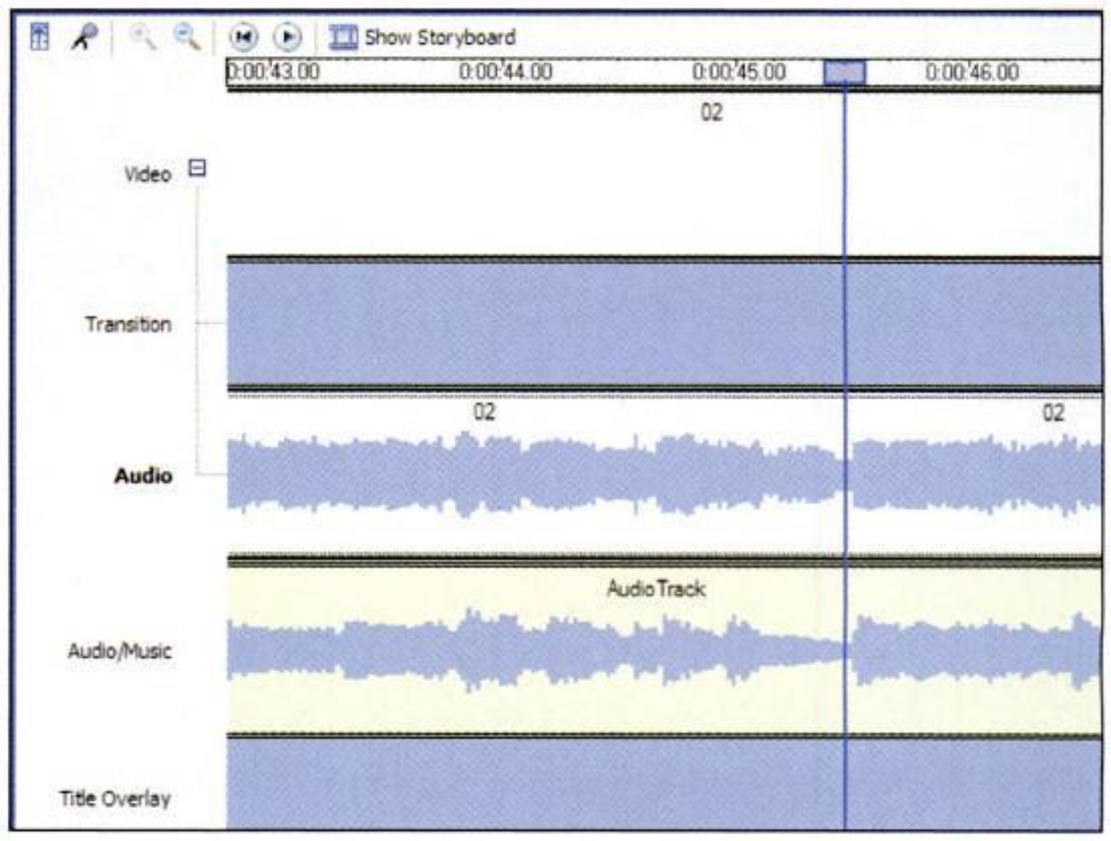

Figure 9 This shot shows the sync point for Analog Clip 02.

with the audio track. The alignment is best heard as the project is previewed rather than seen in the audio waves of the two clips.

Analog Clip 02 zooms into the digital camcorder as it is shooting the stage. How important is it to align the small view seen in the LCD screen with the audio track? Not critical for sure, but it's better aligned than not. Listen for "WOW—You're Beautiful" in each track, an easy one to pick up on and use for basic alignment. When you've got it close enough—you don't have to be exact—expand the timeline tracks, zoom in as much as possible, and pick up on the wave pattern alignment point between them (see Figure 9).

Analog Clip 02 starts at the 0:00:38:93 point of the audio track. And Analog Clip 03 is easy to sync by visually spotting this area of the wave patterns. It's only a three-second segment, but there's enough to sync with. The clip starts at 0:01:09:07 of the audio track.

Listen to Analog Clip 04 in the project and watch the wave patterns as they relate to the audio track. The clip starts at 0:05:06:27. Look and listen to determine sync points. What you see in the wave patterns should align with what you hear. If it

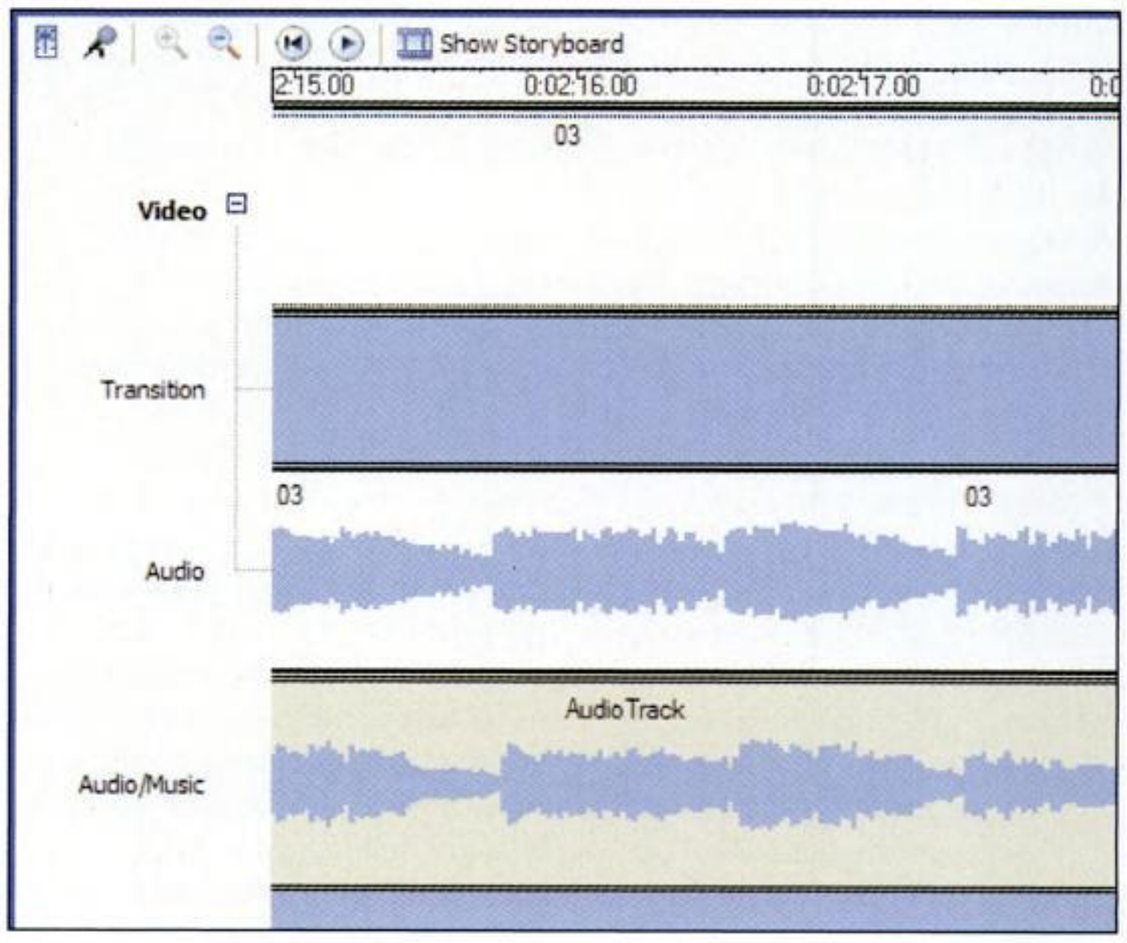

Figure 10 Analog Clip 03's sync point.

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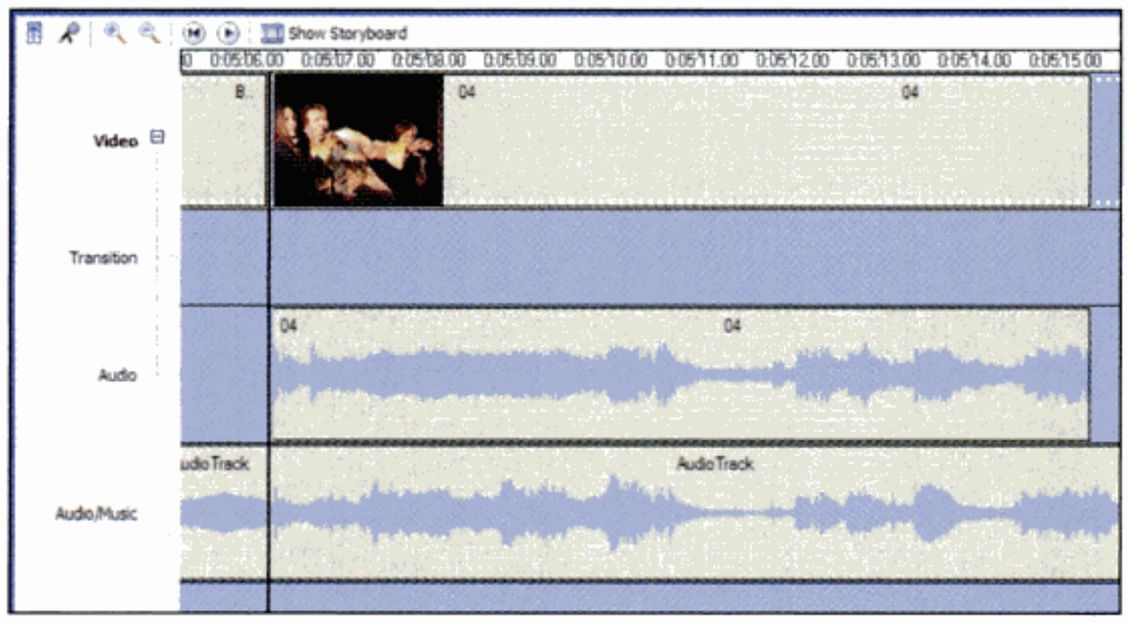

Figure 11 Analog Clip 04's sync point.

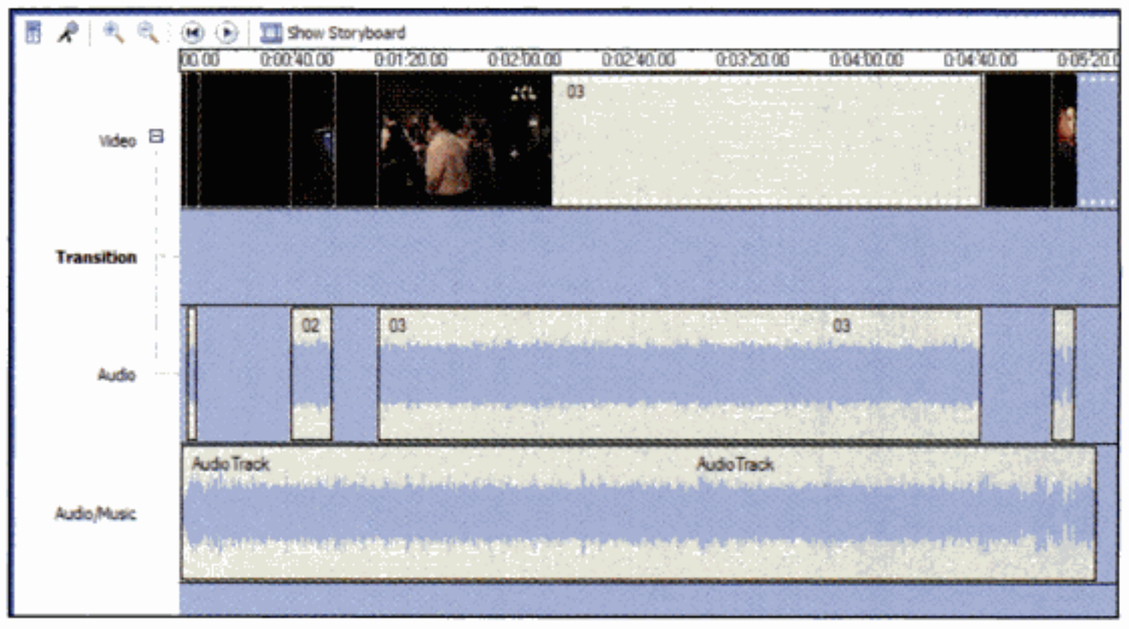

Figure 12 Here's an overview of all the audio sync positions.

doesn't, do some more moving and checking. And don't forget to watch what's happening on the video.

Use the sync-point info to realign the clips as you slice and dice things on the timeline. As long as the audio yardstick stays in place, you can easily re-sync clips as needed. Zoom out for an overview of the timeline. Be sure the big yardstick, the audio track, stayed snug to the left. Unlike the video track, other audio clips don't have to butt up to the left.

Now sit back and look at an overview of the timeline. In the first 70 seconds of the video track, there's only 20 seconds of analog tape footage: there's the 5 seconds of applause from the previous dance, and the 15 seconds of the analog camcorder zooming into the LCD screen of the digital camcorder. Most of the timeline in this area is using black filler clips. One of the visualizations from the stock library will be used at the beginning, and you'll use lots of clips from the digital camcorder footage to replace the black clips.

It's time for a second-pass at splitting the clips. It'll be the first time you split the digital camcorder footage, and a more aggressive splitting of the analog clips. We counted the clips in a well-done, slow, romantic-paced professional wedding video, and found the average clip duration to be eight seconds. At that pace, this 5-1/2-minute video would need 41 clips. Let's go split 'em. (For those who like stats like these, we ended with 33 clips in the storyboard for an average of 10 seconds.)

Do the second-pass splitting aggressively and artistically. Be ruthless but appropriate. From this point to the end of the project, splitting is more art than science. Get in touch with the tempo and rhythm of the footage and the music, and do it all with your personal vision, however cloudy, of what you're trying to achieve. Here are some guidelines:

• Look for changes in visual or audio content—places where splitting is logical. Remove any fast pans or zooms. Sometimes it's easier to leave a camcorder running when quickly moving from one scene to the next. Another easy split point is someone walking in front of the camera as it was shooting something else.

• Look for poor footage to discard. Out-of-focus frames are obvious candidates. (So are scenes where I forgot the camera was on and shot my foot.)

• As you split, rename the clips. Be descriptive and include your assessment or rating. Note your gut-level decision to keep versus scrap. If you subscribe to the 80/20 rule, look to scrap the 80 percent, not the 20 percent.

•Tag the clips to discard but don't delete them yet. If it's someone walking past the camera, split it when he's in the middle of the frame. Don't split it twice so you end up with a clip of him walking from one side to the other. You can easily trim the clips in the timeline to remove him from view, and those extra frames on the good clips always come in handy when you rethink trim points.

• If a clip is still there after using the above guidance and it's longer than 10 or 15 seconds, split it anyway. Anything longer than that has to be really great to keep the viewer's attention. Even if it is, adding extra interest with a special transition or effect can add sparkle and help your "killer" movie. Be ready to strongly defend any clip over 15 seconds. Alone in your editing room, you only have to defend it to yourself, at least until your first showing.

After our second pass there were still three big clips of 46 seconds, 34 seconds, and 1 minute, 57 seconds before applying the final guideline. If you did the camcorder shooting and are doing the editing, you might be too emotionally attached to a clip. If you're just the editor, chopping it up is easy and fun. You can't split too much. (But just in case you do, use *MM2's* Clip > Combine feature to replace them.)

Base the second-pass splitting of the digital camcorder footage on changes in what's happening on stage. Our splitting got it to 22 clips with durations between 7 and 21 seconds. Nine of these clips were tagged as "good" or keepers, with something unusual going on during each. One scene toward the end included an impromptu marriage proposal by someone who jumped on-stage from the dance floor.

The start time properties of all clips from the digital camcorder align exactly with the audio track, which is because the audio track was ripped from the same starting video footage that all the digital clips were made from. When working with any of these clips on the timeline, a glance up to the collection will tell you exactly where the clip starts. If syncing is important to the clip, achieving it is easy. If it's not important, you can move the clip to wherever it works best in the project.

When we finished the second splitting pass, there were 33 video clips that were candidates for moving into the timeline.

MM2 doesn't automatically back-up the collection database. By this point you've put a good bit of effort into splitting all these clips, so **now is a great time to back up your collection database.** The zip file on the CD includes a backup copy of our collection database for this project. The file name is MEDIATAB0.DAT.

Step Six: Putting It All Together

A "Killer Movie" gets a head start with great video and audio source files. But what *really* pushes it over the top is your personal vision, imagination, and creative energies. It's not the

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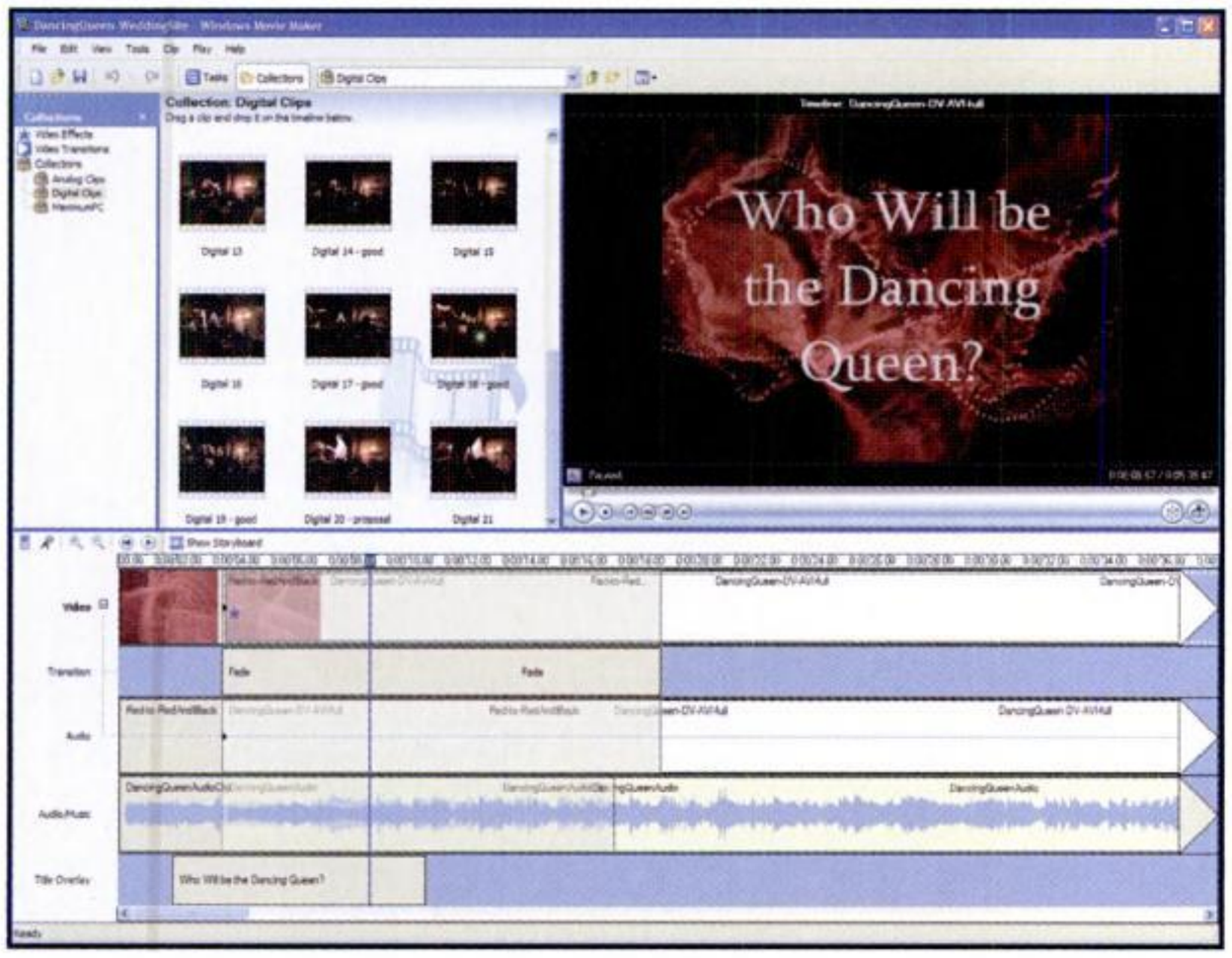

Figure 13 A close-up view of the timeline during project editing.

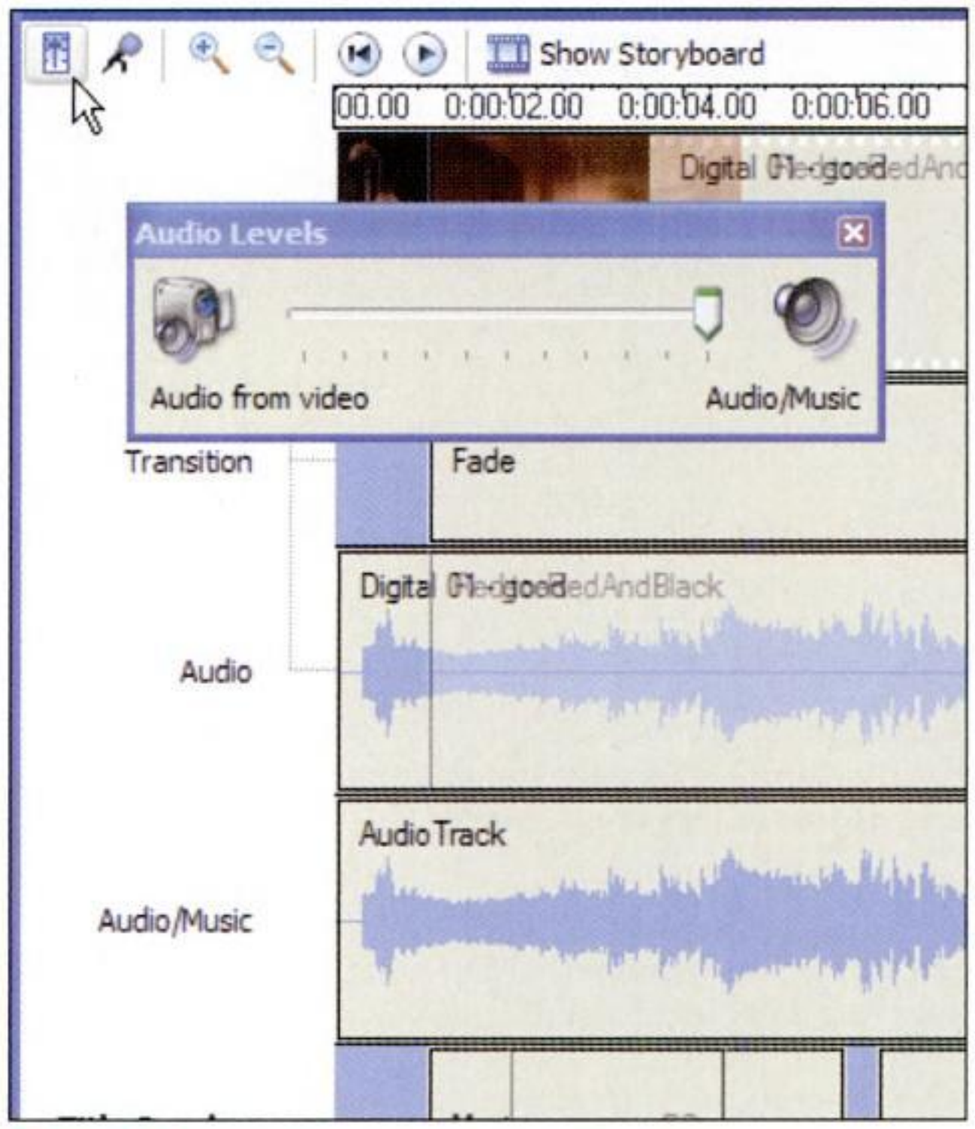

Figure 14 Adjust the audio balance between video clips and the audio/music track.

source files; it's what you achieve with them.

This step should consume most of your efforts. We got you to the point of having source material and splitting it up. We gave you copies of the files that show you what we did. For your personal "Killer movie," the rest is up to you.

Start with the audio. We've said it before and we'll say it again: The audio is at least half of the viewing experience. Great sound can easily be taken for granted. To check how important it is, see how long you can watch a movie with no sound. Then try listening to it with your eyes closed. You'll last much longer when only hearing it. We talk about watching or viewing movies, but it's really about *experiencing* them.

Not only does an audio track get you well on the way, it also determines how long the video will be. All you have to do is fill in the visual space between the first sound and the last... and you do that easily with *MM2*.

With the audio covered, it's time for the final arrangement of video clips, and for placement of text and transitions, which is a very subjective, and non-linear process. Here's how we arranged our final film—don't be afraid to experiment as you do yours.

With the audio track in place, we selected and moved digital camcorder clips into the timeline. They were easy to sync because we knew their exact starting positions, and we had the black filler image to space them just right. We selected clips so there would be a good mix of digital and analog camcorder clips—the digital ones aimed at the stage and the analog ones focus on the dancers.

We then brought selected clips from the analog camera into the timeline, deleting black fillers as we went. We moved along from left to right, overlapping and trimming as we went, and we re-established the sync after each new clip was in place. Overlapping two clips in the timeline creates a basic fade transition that you can keep or replace later with a different one.

Preview the complete project a number of times and think about special video effects and transitions.

We used three standard *MM2* special effects: "Ease In" (four times) on the analog camera zooming into the DV camera's LCD screen, "Hue, Cycles Entire Color Spectrum" for a dance-floor clip, and "Watercolor" for a longer clip of the bride and bridesmaids. To apply one, just drag it from the collection of Video Effects and drop it onto the selected clip. Up to six of the same or different effects can be added to a clip.

For transitions, we left 20 cross-fades, but replaced nine with "Flip," "Plus! Star 10," "Shatter, In," "Plus! Evaporate," "Wheel, 4 Spokes," "Page Curl, Up Left," "Roll," "Shrink, In," and "Whirlwind." If you don't have the Plus! pack with these extra transitions, replace them with ones you have. Drag a different

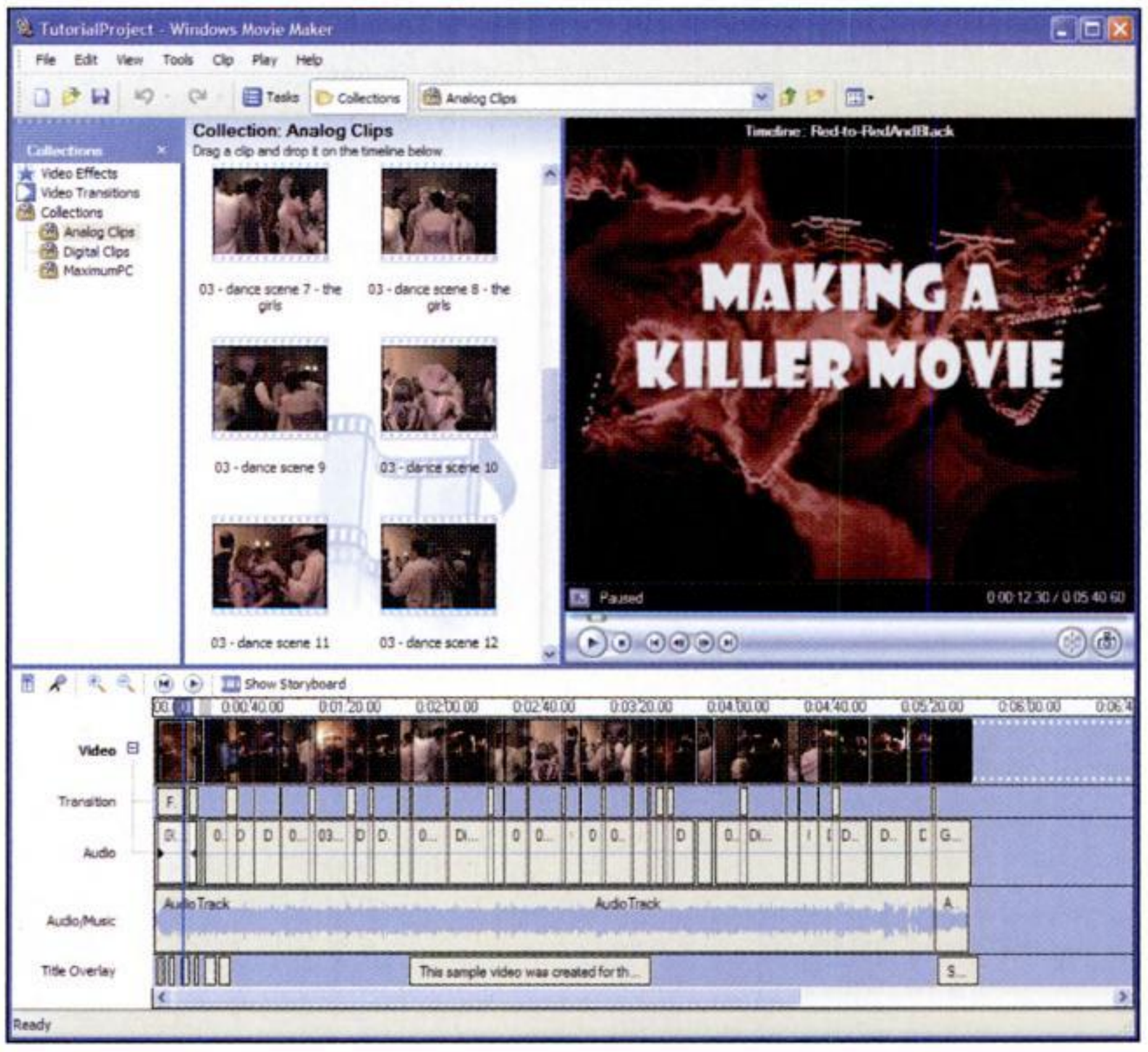

Figure 15 An overview of our finished project.

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Figure 16 Choose your location—for this story, it's your computer.

one onto the current transition and the new one will automatically replace it.

We then added nine text overlays, from opening title to closing credits. Put some thought into the first text clip and choose the font, font color, and level of transparency. Then copy/paste it to make the others. Slide them into position and double-click each to automatically open the wizard to change wording and animation.

The last step is to adjust the audio levels setting so the movie uses just the audio/music track and not the audio of the individual clips. Click the icon on the upper left of the timeline and move the slider all the way to the right.

When finished and zoomed out of the timeline, here's what our project looks like (see Figure 15).

A copy of our project file, "StoryProject.MSWMM," is included with the zip file on the CD. There's also a copy of the project file used for the original version of the video made for the wedding site and DVD: "WeddingSiteVersion.MSWMM." Even without source files, you can open a project file in *Movie Maker*, zoom into the timeline, and study the clips used, how they were arranged, what transitions and effects were used, what text clips were added, etc. Any project file can be studied this way.

Figure 17 Depending on your needs, there are more than enough video-quality choices to pick from, and you can always add a custom profile of your own.

Step Seven: Save (Render) the Movie

When all the editing is done, you can relax as a wizard guides you through the steps to save it as a movie. This is the rendering step—you're almost there!

Your final choice of an appropriate video quality depends on your method(s) of viewing and distributing. A good way to choose is to use the file size constraint option. Look at the file size, pixel dimensions, bit rate, and other items provided by the wizard as you toggle the file size constraint. Select one that's appropriate for you. If you're making a DVD, then the right choice is DV-AVI.

The two versions on the CD were rendered to achieve bit rates of about 1 Mbps.... enough for a good 640x480 video that plays smoothly on today's average computers.

Saving or rendering the movie isn't a real-time process—It's a long one, and the time will be considerably longer than the actual video duration. In Figure 18 we see that the 5-1/2 minute movie is 58%

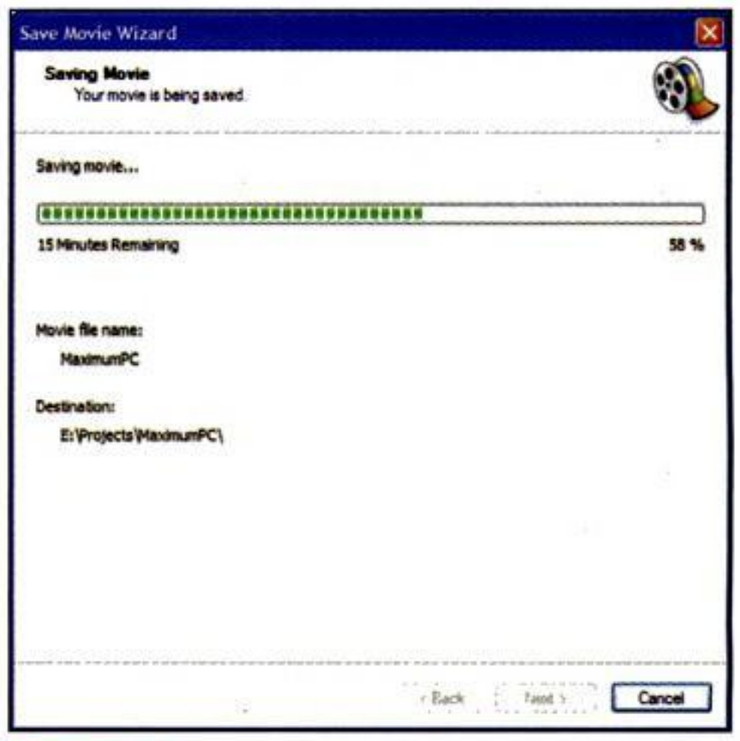

Figure 18 The final rendering of your first Killer movie.

complete, but still has 15 minutes of rendering to go. The good news is that you can do other things with your computer as the rendering happens, without affecting the result.

Step Eight: Watch It in Your Video Player

Now for the fun part—watching the fruits of your labor! Experience it in your Windows Media Player.

We think ours looks great! But yours may be better. Watch it on your computer, upload it to a website, copy it to a CD, burn a DVD, sync it with your Portable Media Player and new multimedia phone.... distribute it as many different ways as you want. Enjoy it and then show it to others.

Think about your audience. Give them a copy in a format and file size they can easily play; they'll enjoy it more if they don't have to wrestle with players, file types, and codecs. Just be prepared for the inevitable... when they see what you did, some of them will whip out their old dance videos and ask you to do one for them. ■

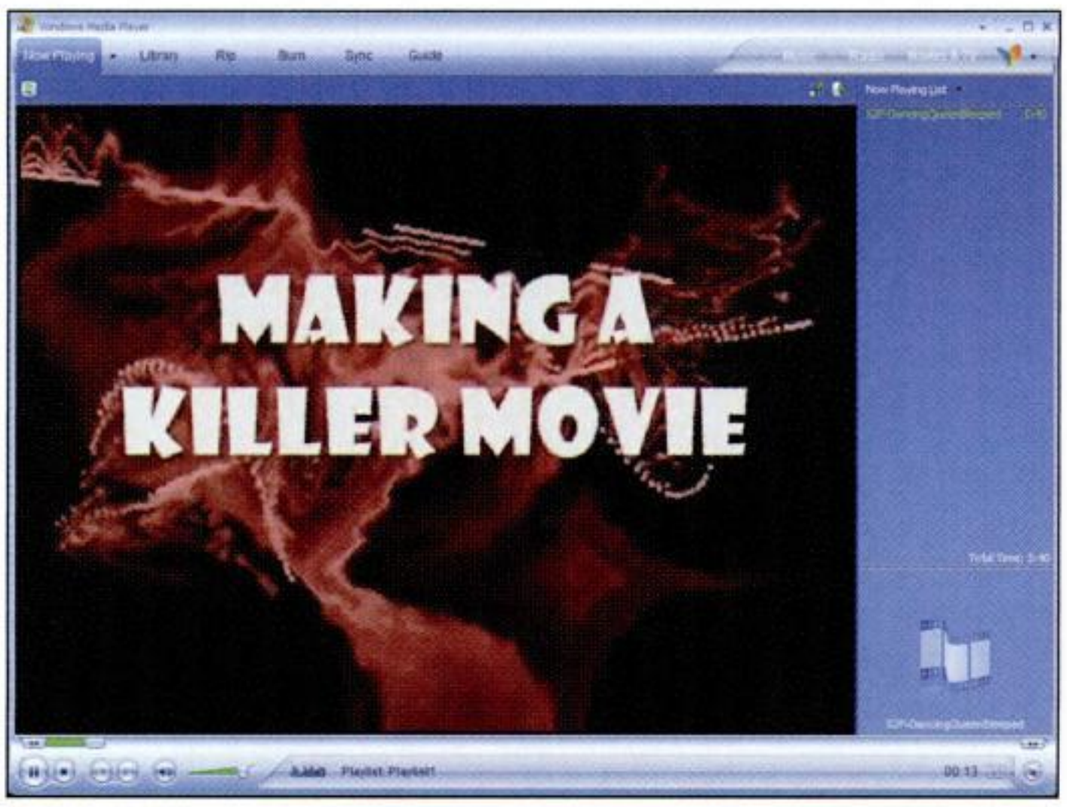

Figure 19 Viewing the final film in *Windows Media Player 10.*

John Buechler, "PapaJohn," is well known in the *Movie Maker* community. His two books were the first ones published about *Movie Maker 2*: *Movie Maker 2—Zero to Hero* and *Movie Maker 2—Do Amazing Things*. His *Movie Maker 2* website—www.papajohn.org—is an authoritative online reference for *Movie Maker* users, and he publishes a weekly subscription-based newsletter about *Movie Maker 2* and *Photo Story*.

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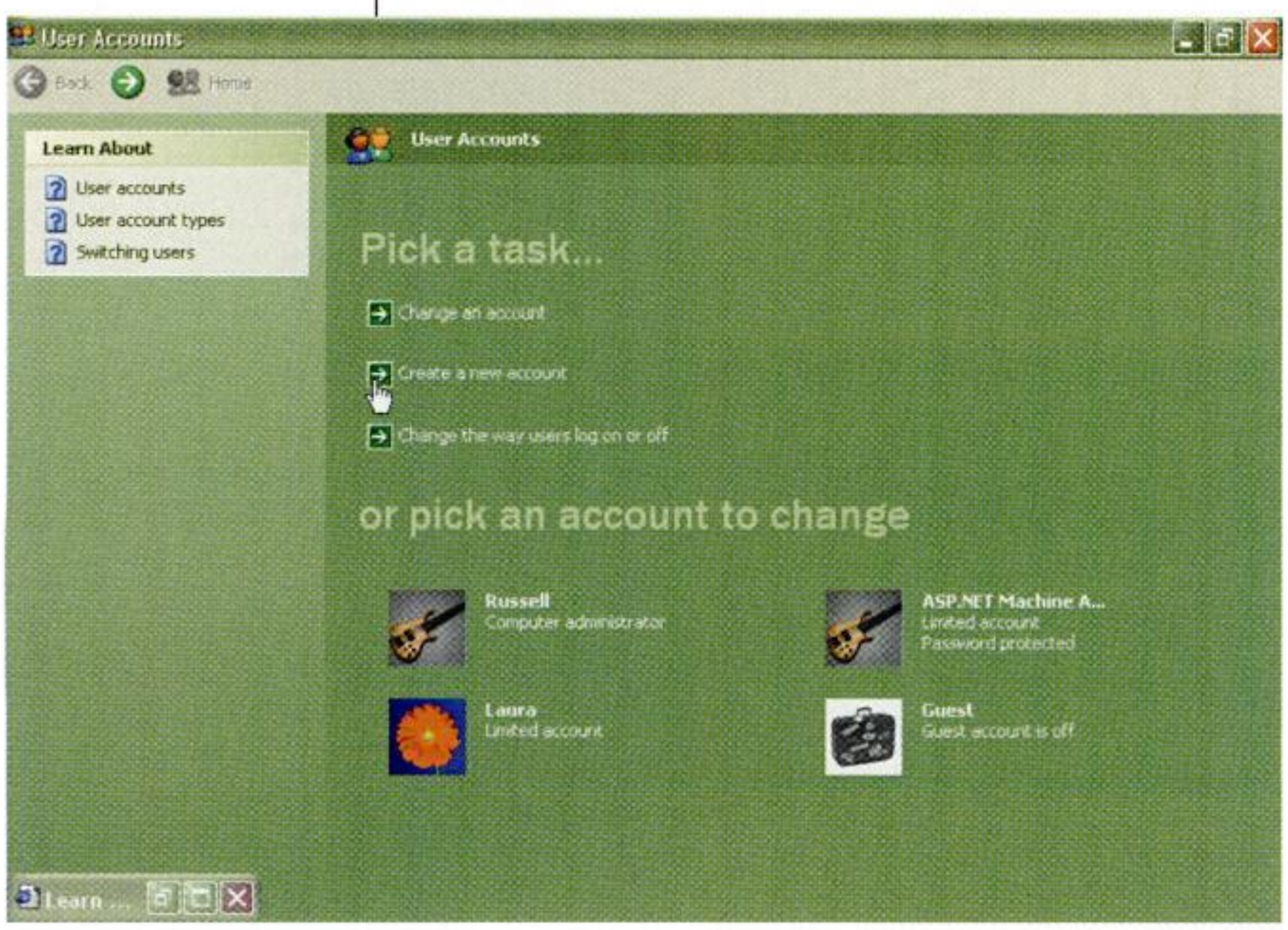
How To... Lock Down Windows XP

A step-by-step guide to tweaking your PC Experience

Four simple steps toward better PC privacy and security, today!

The information stored inside your PC can reveal a lot about you: your financial situation, your family and personal relationships, your hobbies, your shopping preferences... Now, imagine a stranger poking around your hard drive, seeing all this and learning all about you. Kinda gives you the willies, doesn't it?

Fortunately, Microsoft has built a number of privacy and security features into Windows XP that help prevent this kind of intrusion. But you need to know how they work and how to activate them before you can take full advantage of the protection they have to offer. We'll show you how.



As you might know, Windows XP is available in two different versions: XP Home Edition and XP Professional Edition. The Professional Edition offers stronger security, but the Home Edition is no lightweight, as you'll soon discover.

Step One:
Set Up User Accounts

The first step in boosting the privacy capabilities of Windows XP is a bit basic, but often ignored: Establish user accounts for each person you plan to grant access to your computer. This not only gives you the power to limit who has access to which files stored on your computer, but it also gives each user the power to customize the PC to their own preferences.

If you want to prevent your kids from accessing your financial records, for example, but still let them use your personal-finance software to manage their own budget, you can. And if you want your desktop background to be a group photo of Spinal Tap, but your son or daughter prefers a portrait of Usher, you each can have your own way.

For each user account, Windows XP will keep track of preferences such as favorite Websites, default font size and type, desktop wallpaper, screensaver, and more. You, as system administrator, can grant—or deny—access to any folder or file. What's more, each account holder will have their own My Documents folder for storing word-processing documents, spreadsheets, photos, and other types of files.

Add password protection for each user account, and no one else will be able to access anyone else's files unless those folders are labeled "shared" resources. If you *don't* create a password for

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each user account, anyone with access to your PC will be able to see anyone else's files—even those stored in private folders—by logging in using that user's name. And don't use the name of the family pet for your password. Random sequences of numbers and letters are best.

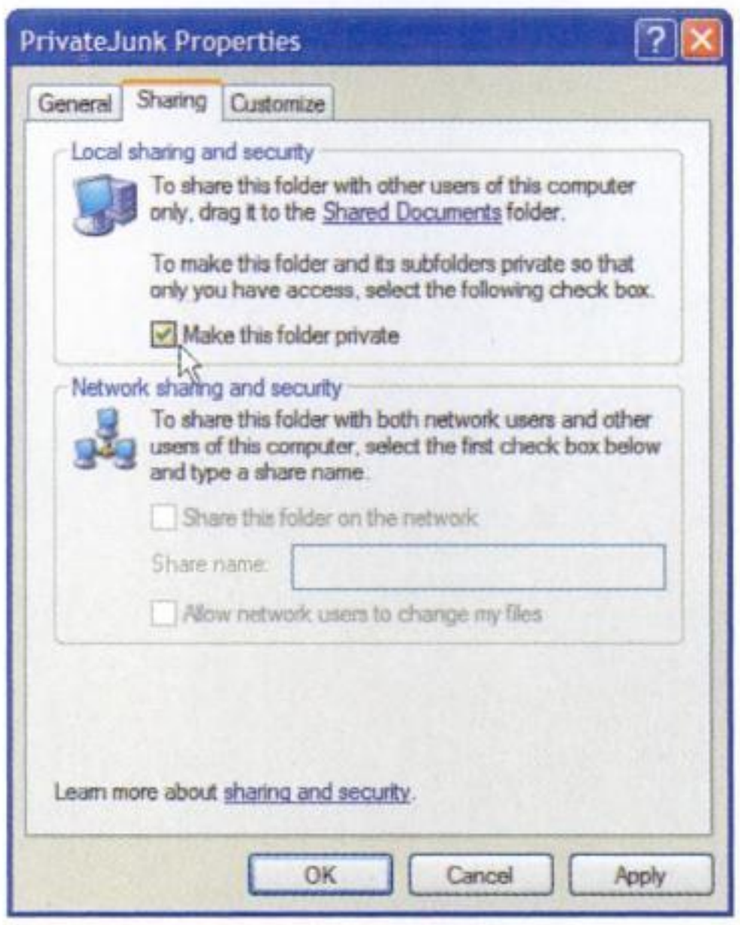
To add password safeguards, you will first need to create a user account of your own. Here's how:

1. Click on the Start menu>Control Panel>User Accounts.

2. Under the heading that reads "Pick a task..." click on "Create a new account."

3. Under the heading "Name the new account," type a name for the new account and then click Next.

4. Under the heading "Pick an account type," click the button next to Limited. (We'll explain why below.) Now, click on the button that reads "Create Account."



You may think you've hidden your sensitive data well, but designating folders as private takes your security to the next level.

Sure, your kids and family dog are cute and all but their names make lousy passwords—use random sequences of numbers and letters. Write 'em down and store 'em in a safe place if you're the forgetful sort—or check out the trial version of *PC-MAC Password Vault*, it will remember for you and you can download it at www.lavasoftware.com.

At this point, you should be back at the User Accounts window, and it's time to assign a password to the account you just created:

1. In the User Accounts window, click on the account name you wish to change.

2. Under the heading "What do you want to change..." choose "Create a password."

3. Type in a password in the first box and type it again in the second box. In the third box, you can type a reminder hint in case you forget your password.

4. Click on the button that reads "Create Password."

Now, no one will able to log onto the computer using that User Account unless they know the password—that is, unless your password is the name of the family pet (can't say we didn't warn you!).

Step Two: Mark Your Folders as Private

Each person with a Windows XP user account has the option of designating individual folders as "private," which means only they can access them. By the same token, they can also designate particular folders as "shared," meaning that any other user on that computer can access them.

Each user's My Documents folder enjoys a limited amount of privacy by default, in the sense that only someone logged on with an Administrator account can gain access to other users' My Documents folders.

Anyone who logs on using an Administrator account will be able to see folders marked private, but they won't be able to open them.

As Administrator, however, you can easily get around this barrier by going into the User Account system, changing the user's password, and then logging

Limited Versus Admin Accounts

In step one, we created a "limited" user account. With a limited user account, you can change or remove your own password, change your theme and other desktop settings, view any files you've created, and view any files contained in shared folders. In some cases, however, you might not be able to install new programs, and you won't have any control over other users' accounts.

It's always a good idea to create a limited user account for yourself, and use that routinely, even if you're the only person using the computer. That way, if a Trojan-horse program manages to gain access to your PC while you're logged on, it will be restricted as to the damage it can cause because you're signed on with limited privileges.

You'll also want to establish a "computer administrator" account for yourself in order to gain full control of the computer. As administrator, you can create new user accounts (and modify or delete existing accounts), install new programs, and otherwise maintain full control of your computer.

To set up a computer administrator account in Windows XP, go to Start>Control Panel>User Accounts and click on the name of the account you wish to change—preferably it's yours, and you are the primary owner of the PC. Next, click the menu item that reads "Change the account type," and under the "Pick a new account type" heading, select the button next to "Computer Administrator." Done.

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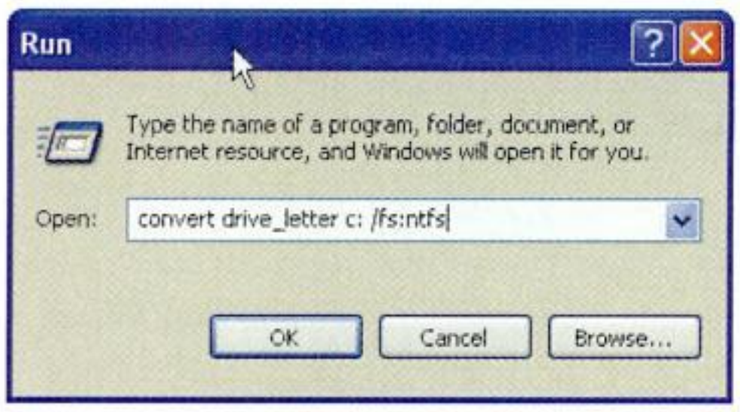


To mark folders as private, you'll need to make sure your hard drive is using the NTFS file system.

in using that user's name and the new password.

Here's how to mark a folder as private:

1. Double-click on My Computer.

2. Double-click on the drive on which Windows XP is installed, typically the C: drive. (Note: If you're greeted with a message that reads "These files are hidden," click on the menu item under the heading "System Tasks" that reads "Show the contents of this drive.")

3. Double-click on the Documents and Settings folder.

4. Double-click on the folder labeled with your user name (drill further down, if needed, to find the folder you're looking for).

5. Right-click on the folder you wish to mark as private and choose the Properties menu item.

6. Click on the Sharing tab and place a checkmark next to the item that reads "Make this folder private."

Step Three: Convert Your Hard Drive to NTFS

In order to mark folders as private, the hard drive on which they're contained must be set up to use the NTFS (New Technology File System). If your computer came from the factory with Windows XP installed, you probably don't need to worry about this, because it's the default setting for Windows XP machines. If you want to be sure, simply double-click on My Computer, click on the icon representing your hard drive (typically the "C:/" drive), and look in the Details box in the left-hand column. If it says "NTFS" next to the item "File System," you're all set.

If it says "FAT32" or anything else, you can easily convert the drive to NTFS. Here's how: Go to the Start menu and choose Run. When the Run window appears, type in this command: convert drive_letter c: /fs:ntfs (note: this assumes your primary hard drive is labeled "c:" , which is the most common scenario) and click OK. Restart your computer.

Warning: Don't convert your hard drive to NTFS if you think you might need to uninstall Windows XP down the road.

Step Four: Activate Windows XP's Built-in Firewall

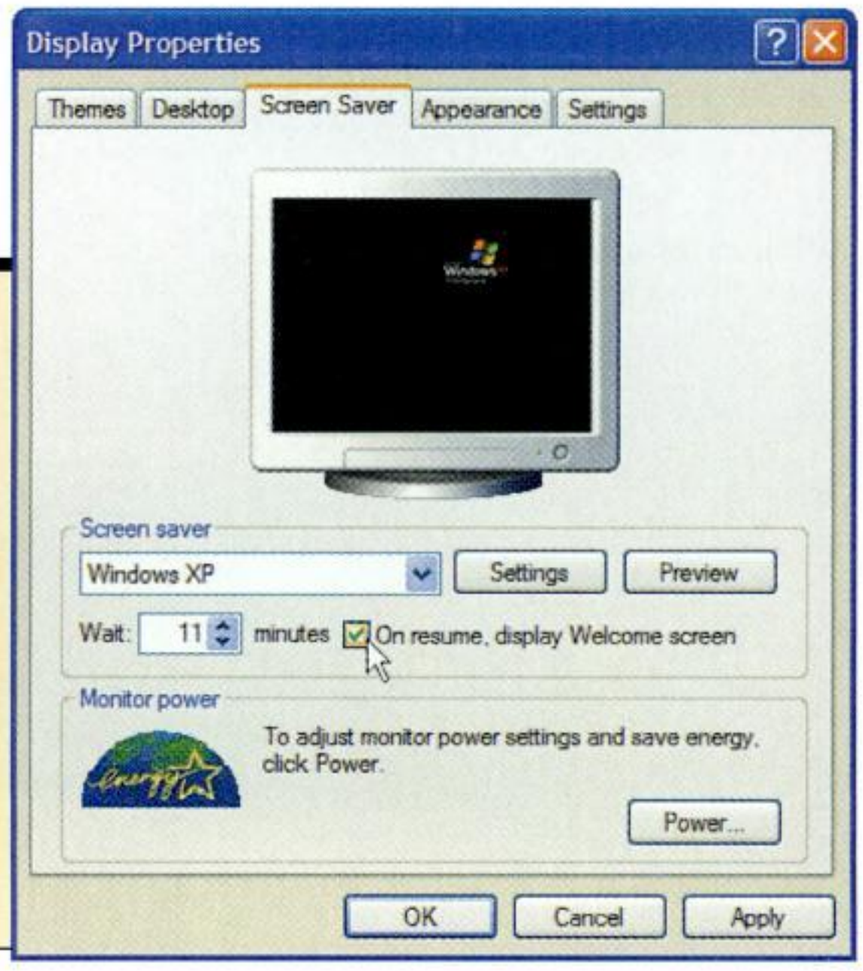
A robust firewall can deliver excellent protection from security threats by preventing unauthorized access by online intruders. Windows XP has a rudimentary firewall built in: It's called Internet Connection Firewall (ICF). This isn't a robust solution, but it's better than nothing.

ICF checks incoming traffic from the Internet to prevent hackers from invading your PC. It works by rejecting unwarranted communication from Internet sources, but if a virus or Trojan horse makes its way onto your computer through some other source—a floppy disk or as an attachment to a downloaded file, for example—ICF won't prevent that malicious software from sending sensitive information from your computer to a hacker over the Internet.

ICF can also cause problems if you have several computers and a printer or scanner networked together. If you already have a commercial firewall product installed (you'll find the free version of Zone Labs' popular *ZoneAlarm* program on the disc accompanying this issue), you'll want to leave ICF off.

XP's built-in firewall offers basic protection from hackers. The new Service Pack 2 update takes this protection to a higher level with the new Security Center feature—download it today!

Our recommendation, therefore, is to install a commercial firewall program, such as *ZoneAlarm*. But if you'd prefer not to take that step, you should at least activate ICF. Go to Star menu>Control Panel>Network and Internet Connections>Network Connections and right-click on the Dial-up, LAN, or High-Speed Internet icon you use to connect to the Internet, and then choose Properties from the pop-out menu. Click on the Advanced tab, and in the box labeled "Internet Connection Firewall," place a checkmark next to the phrase "Protect my computer and network by limiting or preventing access to this computer from the Internet." ■



Screensavers: More Than a Pretty Diversion

If you are frequently away from your computer for long stretches at a time, you can configure your screensaver to provide automatic security while you're gone. Activate your screensaver's password-protection feature, and you'll need to provide your password to bring it back from its temporary slumber. Right-click anywhere on the desktop and choose Properties from the pop-up menu. Click on the Screen Saver tab in the Display Properties window, and choose a screen saver from the drop-down menu. If you're using Home Edition, place a checkmark next to the item that reads "On resume, display Welcome screen." If you're using Professional Edition, place a checkmark next to the item that reads "On resume, password protect."

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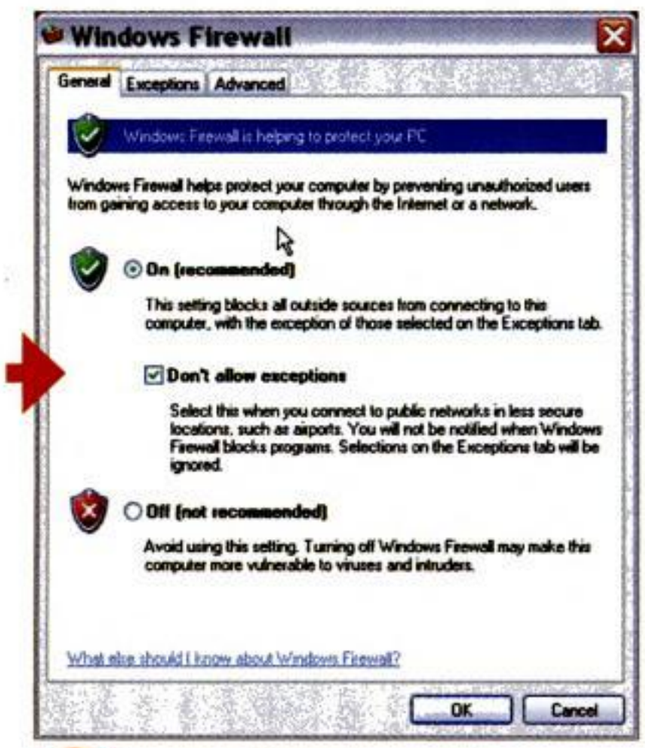
Service Pack 2's Security Center

If you're worried about your PC's online security, it's time to ditch ICF with SP2

Microsoft's second major update for XP, Service Pack 2, puts some much improved security options at your fingertips, courtesy of the new *Security Center*, which manages automatic updates, brings a tougher firewall to the table, provides a pop-up blocker, and integrates with third-party virus protection. The new firewall allows you to configure internet access for individual applications, as well as set port-level access privileges. Here's how to get it up and running in no time.

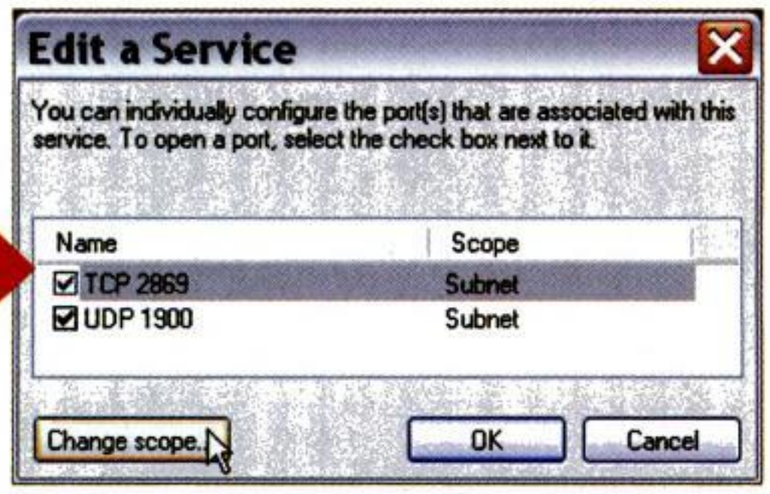
1 Launch SP2's *Security Center* by selecting Start>All Programs>Accessories>System Tools>Security Center. First, configure the Firewall by clicking on the Windows Firewall link.

2 If you have a third-party firewall like *ZoneAlarm* already installed and configured, we still recommend you stay with it. If this is the case, you'll need to select the "off" radio button on this screen to disable SP2's firewall, which Microsoft naturally does not recommend. If not, then select the "on" radio button.

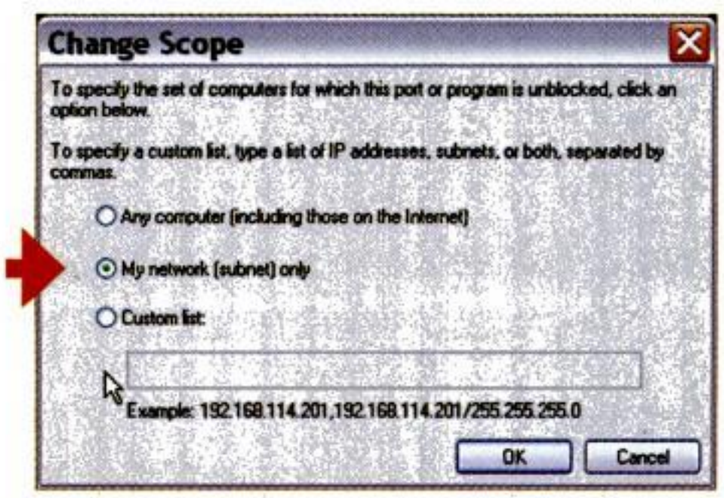


3 For maximum security, ensure that the firewall is on and check the "Don't allow exceptions" option. This will keep your PC very safe, but will also block most network traffic and severely limit your online options.

4 To set up exceptions, which are sites/programs you want to have access to the 'net to and from your PC, clear the previous box and move to the Exceptions tab. Check the programs and services that you want to have access. You can give any other program on your PC access by selecting Add Program and choosing it from the list. Most people don't need to go any further than this step.



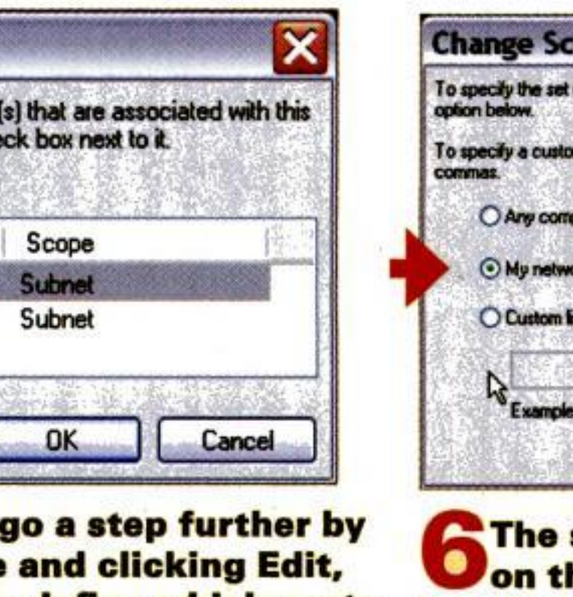
5 However, you can go a step further by selecting a service and clicking Edit, which will allow you to define which ports each service may use when accessing the Internet. Select Change Scope to further narrow down which PCs on your network will be able to access the service.



6 The scope may include every PC on the Internet, your own subnet (which is typically 255.255.255.0) or PCs with specific IP addresses and subnets.

Safer Email

SP2 also brings a very welcome addition to Outlook Express' security options: the ability to convert incoming HTML messages into plain text. Receiving emails formatted in HTML is risky because *Outlook Express* processes header scripts in the HTML content, which means any malicious scripts will be automatically executed. You can circumvent this with SP2 installed by navigating to Tools>Options>Read and checking the box marked "Read all messages in plain text." If you're using *Outlook*, you can do the same by navigating to Tools>Options>Security>Zone Settings.



Block Pop-ups!

We all hate pop-ups, and SP2 adds an effective blocking tool to *Internet Explorer* ('bout time!). It's enabled by default after installing SP2, but you can turn it on or off at will via Tools>Internet Options. Hit the Settings button here to configure audio cues that notify you when a pop-up is blocked; to choose from three pre-set levels of anti-pop-up aggression; and to set up trusted sites to be immune from blocking.

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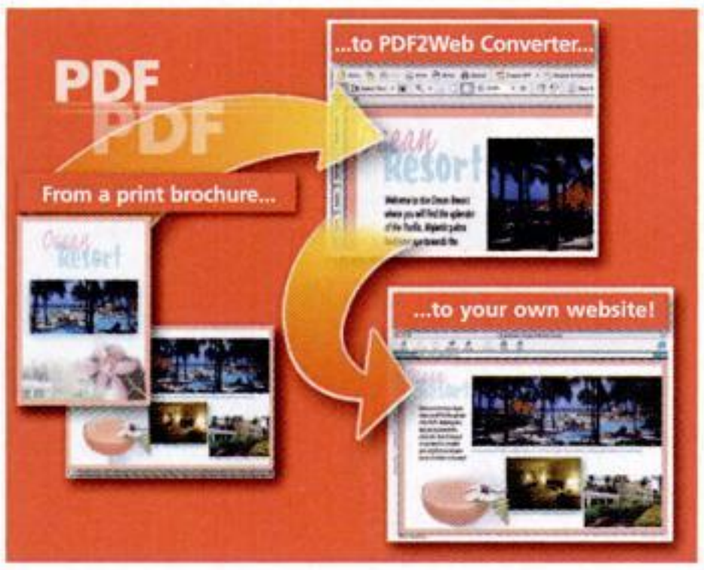

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CGI library	✓	✓
Active Server Pages	–	✓
ASP.NET, .NET Framework	–	✓
Perl, PHP3, PHP4, and PHP5	✓	–
1&1 WebDatabase	✓	✓
Database	1 MySQL	MS Access
Cron Jobs	✓	–
SSI (Server side includes)	✓	✓
DOMAIN NAMES		
Included Domains	3	3
Subdomains	50	50
Run multiple independant sites	✓	✓
Full DNS management	✓	✓
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How To...

A step-by-step guide to tweaking your PC Experience

PREVENT ONLINE Identity Theft AND PROTECT YOUR WALLET

Protect yourself from the scourge of the Internet with these invaluable tips

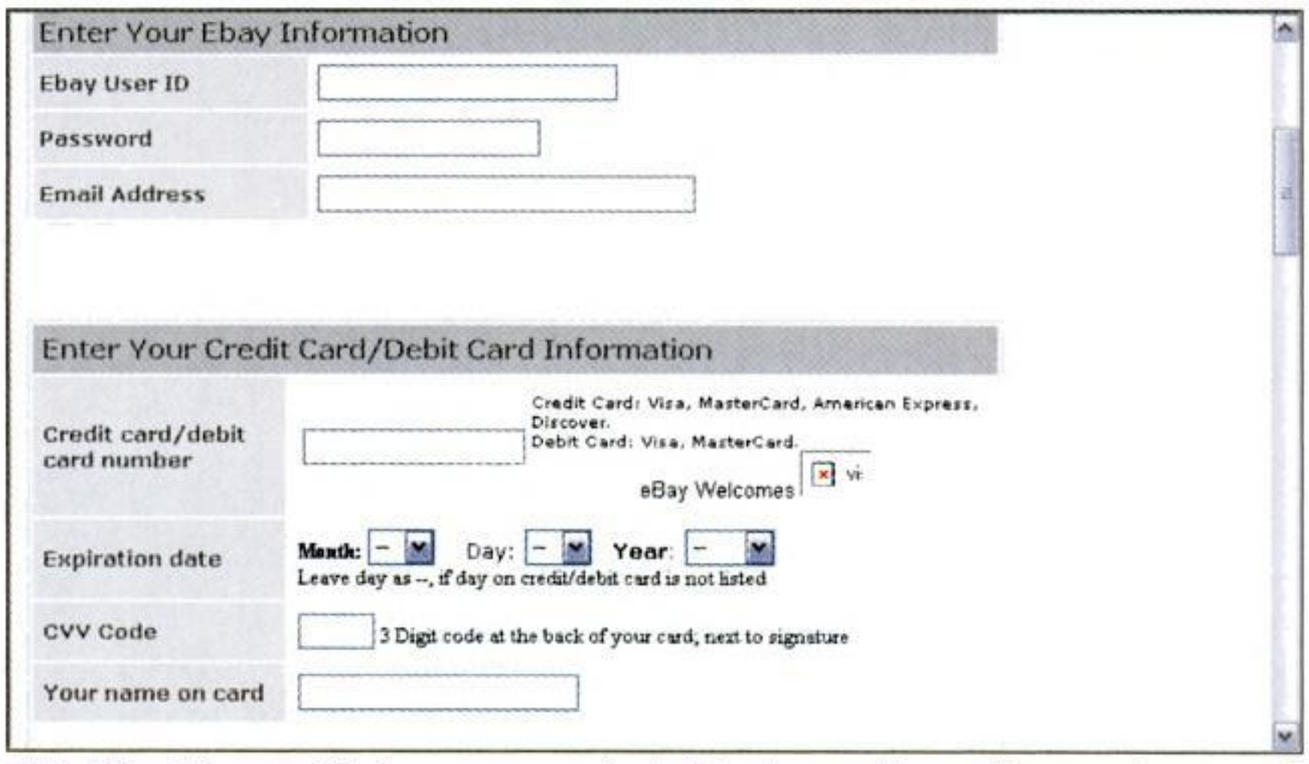
MAXIMUM PC
TIME TO COMPLETION
24/7
HOURS MINUTES

Identity theft is as old as civilization, but the Internet has made the crime almost embarrassingly easy. If you don't take the proper precautions, criminals can obtain your name, your birth date, your driver's-license, credit-card, and social-security numbers—all for the purpose of obtaining money, goods, and services in your name.

Once you understand how online identity theft happens, you can take steps to ensure it doesn't happen to you. The problem arises because so much information about us as individuals is stored in commercial, private, and government databases. Take that state of affairs and combine it with the fact that it's almost become trivial for us to voluntarily provide information about ourselves in order to obtain goods and services over the Internet, and you have a situation ripe for fraud.

In their January 2004 report "National and State Trends in Fraud & Identity Theft, January-December 2003," the Federal Trade Commission announced that for the fourth year in a row, identity theft topped the list of consumer complaints, accounting for 42 percent of all complaints lodged in the FTC's Consumer Sentinel database. The total number of complaints, which exceeded 560,000, was up 40 percent over 2002. And of that number, Internet-related complaints accounted for 55 percent of all fraud reports, up from 45 percent in 2002. The FTC found that identity theft was the leading fraud-related grievance, and it was a contributing factor in other scams.

The consequences of identity theft can be enormous: Your credit could be smeared, you could lose out on that new job you applied for, or you could be denied for a home or car loan. Getting everything sorted out after the fact could takes hundreds of hours.



This illegitimate Web page spoofed eBay's credit-card entry form and was subsequently implicated in an identity-theft scheme.

How Criminals Operate

Although only an increasingly small percentage of online transactions are suspicious, criminals do use the Internet to commit identity theft, largely through an online version of the old confidence game. "Bogus emails that try to trick customers into giving out personal information," said Jana Monroe, assistant director of the Federal Bureau of Investigation's Cyber Division, "are the hottest and most troubling new scam on the Internet."

In what's known as a "phishing" scam, a thief produces an email that's designed to fool you into thinking it originated from a trusted source—your bank or credit-card company, for example. The email will attempt to trick you into revealing sensitive information about yourself by imploring you to click on what appears to be a link to a legitimate Website.

The ruse has been devastatingly effective. In May 2004, the Gartner research firm noted that 19 percent of adult Internet users attacked by phishing scams clicked on the link presented in a phishing email. Of those attacked, 1.78 million adults supplied phishers with their financial or personal information. According to Gartner, phishing victims are almost three times more prone to identity theft–related fraud as other online consumers.

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- Microsoft® Keyboard and Optical Mouse
- MS Windows® XP Media Center Edition 2005
- eVGA NVTV Tuner Card, MS Remote Control

Media Center

$999 Order# MBOX900VXMCE1

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- Dual AMD® Opteron™ Processors Model 250
- 2GB 400MHz ECC DDR (4x512M)
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- 400GB (2x200G) Swap SATA RAID-0 Drive
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- Nvidia Quadro™FX 4000 by PNY OpenGL
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- 15-Bay Full Tower with 460W Power Supply

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- Ready for Linux, FreeBSD or Windows

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POLY SYSTEMS

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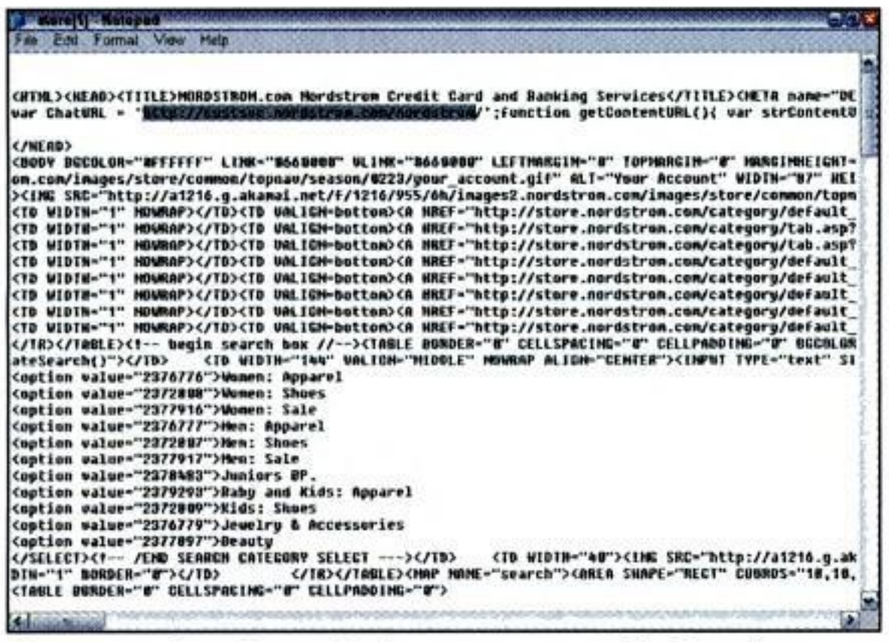

An examination of the source code for the Nordstrom Bank Website indicates that the site is legitimate and has not been spoofed.

How Phishing Works

In order for a phishing scheme to work, the perpetrator must make their email—and later on, their Website—look perfectly legitimate. This is accomplished by a practice known as "spoofing." In an email spoof, email headers—information contained in every email message that documents the many computers it passed through before reaching its final destination—are forged to make it appear as though the message originated elsewhere.

In one spoof incident reported by Carnegie Mellon University, email messages that appeared to originate with local system administrators went out to customers asking them to change their account passwords to new passwords contained within the message. The messages didn't originate with bona fide system administrators, of course, but from intruders trying to steal accounts.

In what's become a frighteningly more common scheme, a phisher will send you an official-looking email that appears to come from your bank, your favorite online retailer, or even your Internet service provider (ISP). The email claims that because of "internal accounting errors" or a recent "security breach," it is imperative that you update your personal information in order to prove your identity and/or keep your account open (see sidebar, next page). Web-spoofing is email-spoofing's close relative. In a paper published by Princeton University, computer-science professors Edward W. Felten, Dirk Balfanz, Drew Dean, and Dan S. Wallach documented how a thief could design a fraudulent Website that exists between an end user and a legitimate Website. Upon coercing the victim to visit the legitimate site, the "fake" Website could intercept any information the user provided—such as a credit-card number—and forward it directly to the thief.

Consider the Source

One of the easiest ways to avoid falling victim to such a scam is to never click on a link in an email that requests personal information. No legitimate company would make such a request, because they're very well aware of how these schemes operate.

If you've landed on a Website through some other means (a link on another site or even a listing in your Web-browser's Favorites menu) and you're still unsure it's legitimate, you can view the Web page's source code. If you're using Internet Explorer, click on the View menu and choose Source. A Notepad window will open displaying the programming statements used to create the page you're viewing. Click on the Edit menu, choose Find, and type the Web address you intended to visit. If you see this address displayed—without a suspicious look-alike address preceding it—you'll know the site is legit.

The U.S. Government's Federal Trade Commission also has some useful advice for avoiding online identity theft, including these nuggets:

All three major credit bureaus, including Equifax, offer subscription services that will monitor your credit history and alert you to changes.

The FBI and the National White Collar Crime Center have teamed up to take on Internet fraud.

- If you get an email or pop-up message that asks for personal or financial information, do not reply or click on the link in the message. Legitimate companies don't ask for this information via email. If you are concerned about your account, contact the organization in the email using a telephone number you know to be genuine, or open a new Internet browser session and type in the company's correct Web address. In any case, don't cut and paste the link in the message.

- Don't email personal or financial information. Email is not a secure method of transmitting personal information. If you initiate a transaction and want to provide your personal or financial information through an organization's Website, look for indicators that the site is secure, like a lock icon on the browser's status bar or a URL for a website that begins "https:" (the "s" stands for "secure"). Unfortunately, no indicator is foolproof: some phishers have forged security icons.

- Review credit card and bank statements as soon as you receive them to determine if there are any unauthorized charges. If your statement is late by more than a few days, call your credit card company or bank to confirm your billing address and account balances.

- Use anti-virus software and keep it up-to-date. Some phishing emails contain software that can harm your computer or track your activities on the Internet without your knowledge. Anti-virus software and a firewall can protect you from inadvertently accepting such unwanted files. Anti-virus software scans incoming communications for troublesome files. Look for anti-virus software that recognizes current viruses as well as older ones, that can effectively reverse the damage, and that updates automatically.

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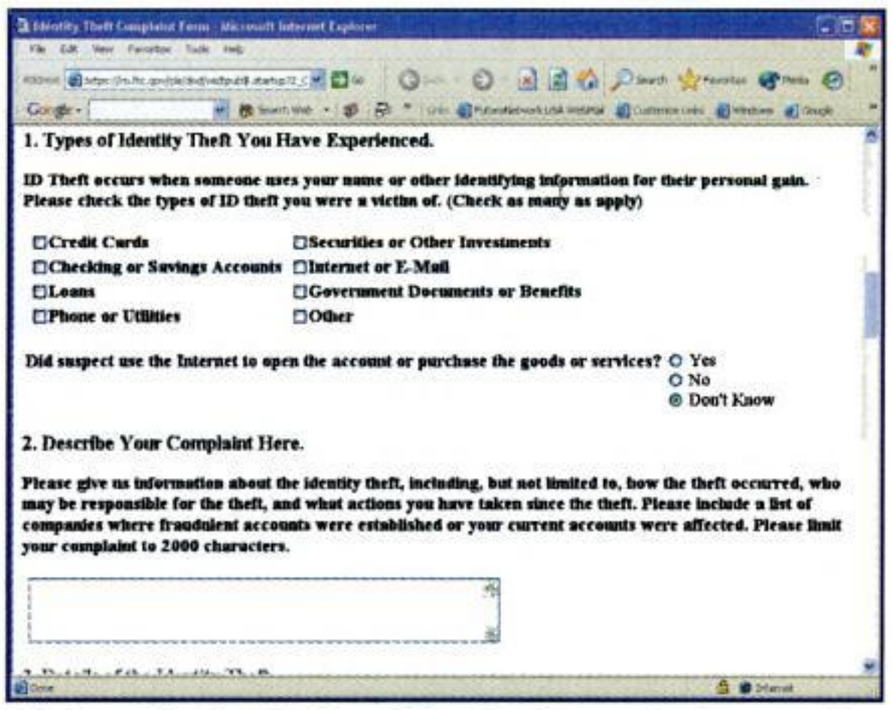


Although the Federal Trade Commission can't resolve identity-theft problems, it does serve as the federal clearinghouse for such claims. You can file ID-theft claims on their site.

Utilities such as *Ad-aware* patrol your hard drive and look for spyware that might have been installed without your knowledge or permission.

- A firewall helps make you invisible on the Internet and blocks all communications from unauthorized sources. It's especially important to run a firewall if you have a broadband connection.

- Your operating system may offer free software "patches" to close holes in the system that hackers or phishers could exploit. For these fixes, check Windows Update at windowsupdate.microsoft.com (no "www").

- Be cautious about opening any attachment or downloading any files from emails you receive, regardless of who sent them.

To this advice, the non-profit Privacy Rights Clearinghouse adds the following suggestions:

- Install a firewall on your home computer to prevent hackers from obtaining personal identifying and financial data from your hard drive. (Learn how to use XP's built-in defenses on page 40.)

- Password-protect files that contain sensitive personal data, such as financial account information. Create passwords that combine six to eight numbers and letters in both upper- and lower-case.

- When shopping online, do business with companies that provide transaction security and that have strong privacy and security policies.

- Before disposing of your computer, remove data by using a strong "wipe" utility program, such as Erase Your Hard Drive (www.eraseyourharddrive.com). Do not rely on the "delete" function to remove files containing personal and/or sensitive information.

Online identity theft is as easy to avoid as it is easy to fall victim to. Unlike muggers or burglars, the criminals who steal identities online need your unwitting cooperation to pull off their heist. As long as you're reasonably vigilant, keep your computer protected with firewall, anti-virus, and anti-spyware software, and are always aware of where you are on the Web, you should be safe. ■

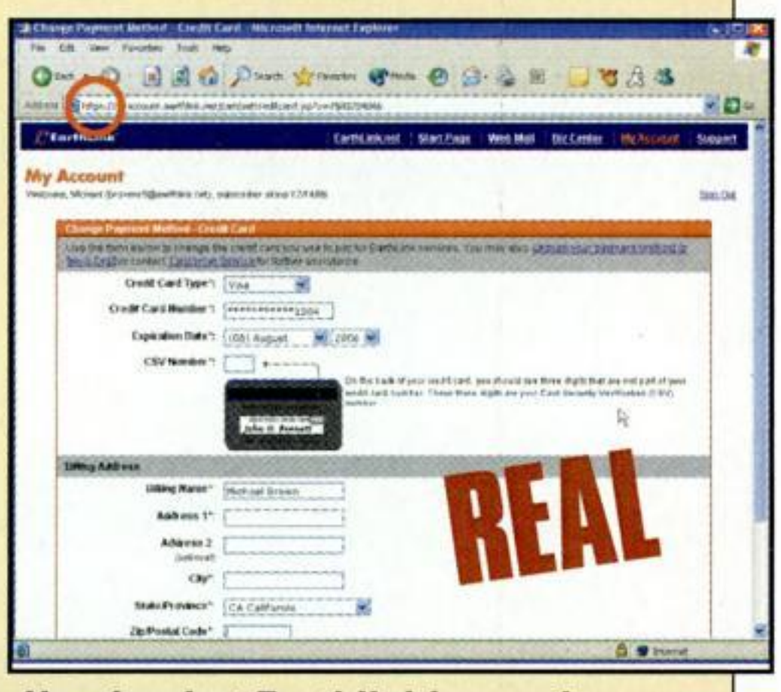
Some financial institution Websites offer forms where you can dispute charges caused by identity theft.

PHISH OR PHOUL?

Here's an example of just how clever phishers can be. The email, which looks quite convincingly as having originated with Earthlink's billing department, indicates that the customer's credit card has expired. For "security purposes," according to the email, this has prompted Earthlink to remove the customer's credit-card information from their files.

Can you spot the telltale signs of a phishing expedition in this email? How about the unfinished sentence at the bottom of the email that starts "Designated trademarks..."?

Here's the page that the email link delivers you to. Notice that the URL displayed in the address window does not begin with "https." That's a sure sign something's wrong—never submit a credit-card number over an insecure connection.



Here's what Earthlink's genuine account page looks like. Notice that the address begins with "https" to confirm that you're providing sensitive information via a secure connection.

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Remain Anonymous Online

Enjoy the Web without giving up your personal information

MAXIMUM PC
TIME TO COMPLETION
01:00
HOURS MINUTES

I Know What You Did Last Cyber.

Sounds like a scary movie, doesn't it? Unfortunately, it could be playing inside your computer right now. Whenever you go online, there are people who would like nothing better than to watch your every move.

Worried? You should be. If you're not taking proper precautions, all the information inside your computer—your credit-card numbers, bank accounts, passwords, email and instant messages, the history of the Websites you visit, and more—can all be tracked, hacked, and used to compile a personal profile of you.

We'll show you how to surf the Web anonymously, so these snoops won't be able to identify you. First, let's explore the consequences of *not* protecting your anonymity.

What You Need to Know

The more personal information a sophisticated scammer or hacker can obtain about you, the easier it will be for them to steal your identity. Armed with as little as a credit-card number and your mother's maiden name—the type of information you routinely provide to online shopping sites—cyber crooks can begin posing as you. They can apply for loans, mortgages, employment, and other credit cards. They can even open a business, run up huge debts, and then file for bankruptcy, all in your name.

Installing software that protects your PC—and you as an individual—is a security precaution no computer user should be without. We explore firewall, and anti-spyware software throughout the rest of this issue—and the benefits of anti-virus programs are obvious. As essential and valuable

Providing sites like Amazon with your personal preferences helps tailor your shopping experience. But since this isn't a secure connection, snoops can also intercept these details and other bits of your personal information.

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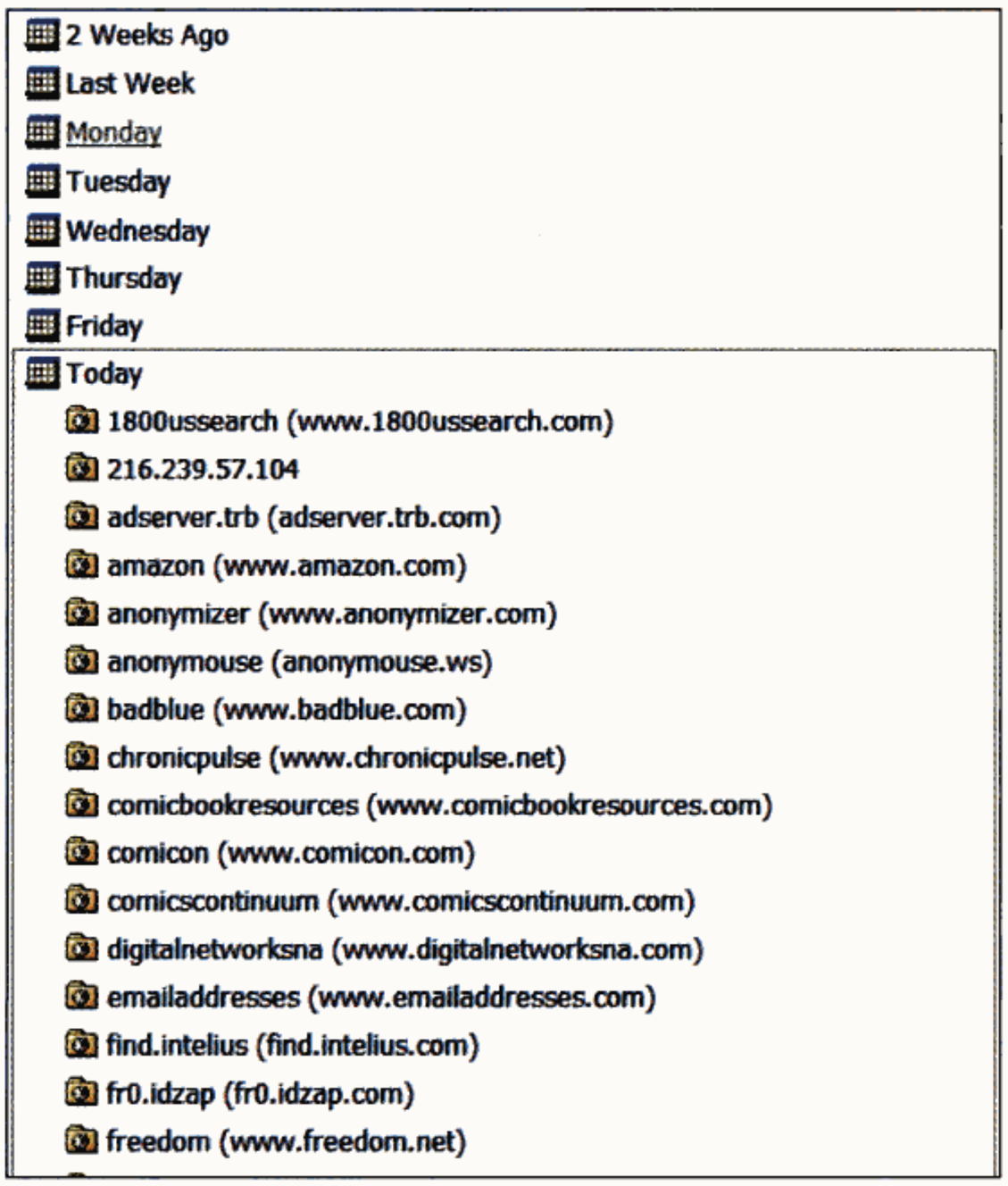


A record of every Website you visit is saved in your browser's history. Anyone gaining access to your computer can see exactly where you've been.

as these classes of software are, they don't do enough to keep your personal information private. What you need now is the type of security tools than can cover your online tracks. Here's why.

Privacy Matters

If you're completely unprotected, even the most benign Websites can track your IP (Internet Protocol) address, which is the equivalent of your cyber-fingerprint. Armed with this information, the Website owner can determine several personal facts about you, including which operating system and browser software you're using; which part of the world, country, state, or city you're logging in from; which Internet Service Provider you're using; what your email address is; and a complete history of every Website you've recently visited.

The same technology that lets you personalize a Website so it "knows" which books you've read, the type of music you listen to, the company stocks you track, and other information in an effort to render your online experience more convenient and enjoyable can also be used to track your digital footprints as you travel across the Web.

Each time you register at a site, tiny files called cookies are stored on your hard drive. Cookies can record your user ID, your password, and other personal information, so you don't have to re-key them each time you return to that site. Cookies are something of a double-edged sword: In theory, only you and the site that deposited the cookie are supposed to access it. In reality, criminals can examine these cookies, use them to build a profile of you, and then trade cookies like baseball cards.

If that strikes you as creepy, realize that your email and instant-messenger program could be even more vulnerable to snoops. Just as a postcard travels through more than a few post offices on its way to its destination, email and instant messages can travel through dozens of computers before reaching their final destination. If they aren't protected en route, they can be easily intercepted and read along the way.

Cheap Anonymity

Not ready to spring for a retail anonymous-surfing solution? You'll find several free services on the Internet. These generally aren't as fast as the pay services, and they don't offer quite as much protection, but hey, whadaya want for nuthin? If you like these, you'll find most offer more features in exchange for a subscription fee.

Guardster
www.guardster.com

Proxify
www.proxify.com

ProxyOne
www.proxyone.com

ProxyWeb
www.proxyweb.net

SnoopBlocker
www.snoopblocker.com

But the biggest cyber-snoops are not uber-hackers. Security experts tell us the people you *really* need to look out for are your friends, your employer, creditors, and other "trusted" parties. At the office, for example, it's perfectly legal for your employer to read your email and instant messages, and track your Web-browser movements—and fire you for using their resources improperly.

If you use a file-sharing service like *Kazaa* to download illegally copied music—or allow someone else to copy such music from *your* PC—you're not only exposing yourself to the possibility of a lawsuit from the Recording Industry Association of America (the RIAA), you might also be leaving your computer exposed to anyone who wants to sneak a peek inside.

Online File Sharing

Interested in sharing legal files without leaving your PC vulnerable to hackers and snoops? Check out an encrypted file-sharing network, such as BadBlue.

If you prefer to use a program such as *Kazaa*, consider encrypting your downloads using a program like *Steganos Secure FileSharing 6*.

BadBlue Personal Edition, $29.99
Working Resources
www.badblue.com

Steganos Secure FileSharing 6, $29.95
Steganos
www.steganos.com

Secret Surfer

Okay, enough talk about how dangerous it can be on the Internet. Let's talk about how you can use this awesome resource without falling victim to the predators on the hunt for the uninformed, the unprepared, and the unprotected.

The key is to use Web-browsing tools and services that can conceal your identify, mask or erase your Internet tracks, block a Website's ability to access your personal information, and encrypt sensitive data. Some of these same tools serve other functions, too, such as blocking pop-up ads, controlling cookies, disabling spyware, and securing your email and instant-messenger software.

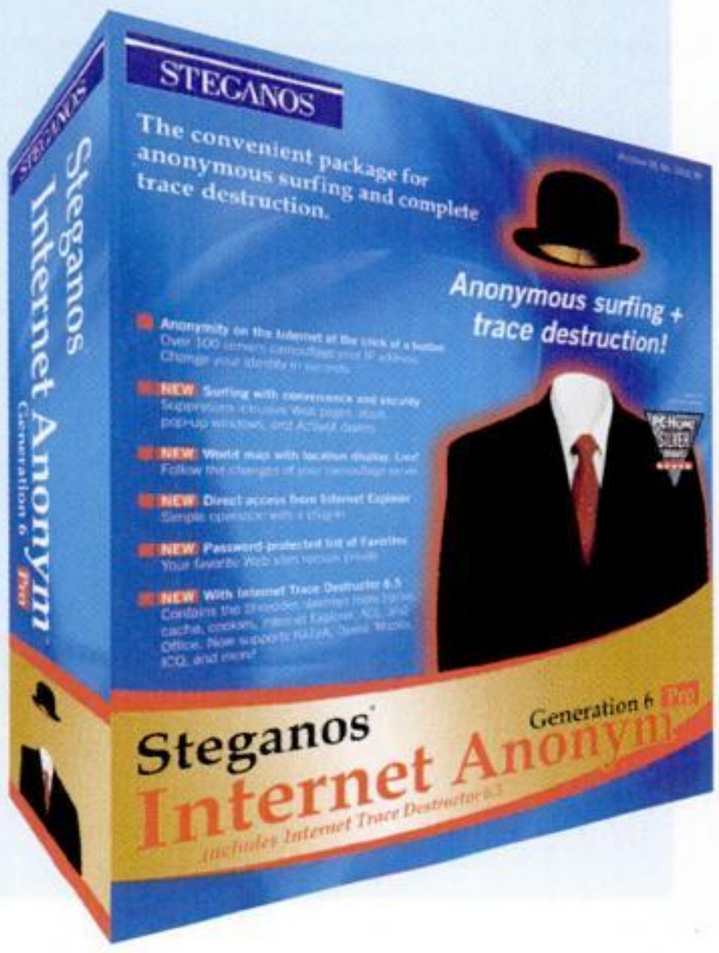
Each of the products we looked at for this roundup will—at a minimum—permit you to browse the Web anonymously. You'll also find trial versions of each program, so you can try them out before committing to any particular solution.

Internet Anonym 6

There are many programs that can render you anonymous while you're on the Web by blocking your IP address. What makes Steganos' product different? It doesn't merely mask your identity; it actually *changes* it every few seconds. It also includes a Webcam anonymizer for video-chat sessions—a feature not offered on the other programs examined here.

Step up to *Internet Anonym Pro 6* and you'll also get *Internet Trace Destructor 6.5.* This utility will protect or delete sensitive information stored on your computer, including your Web-browser history, logs, cache, and temporary file traces from *Kazaa.*

Internet Anonym 6, $29.95
Internet Anonym Pro 6, $49.95
Steganos GmbH
www.steganos.com



Steganos' *Internet Anonym 6* protects your privacy by changing your online identity every few seconds.

Freedom Web-Secure

This product is similar to *Anonymizer 2004* in that it operates from within an Internet Explorer toolbar. And like *Anonymizer 2004,* it provides anonymous browsing capabilities by encrypting your browser's requests, routing them through the company's own servers to strip out your IP address, and then sending them on.

Freedom WebSecure will block and remove such potential privacy and security threats as malicious Java, JavaScript, VB Script, and ActiveX settings. It will also remove ads from Websites, but it won't block pop-ups. Not surfing from your usual computer? Subscribers can download, install, and log into WebSecure Roaming using any PC.

Freedom WebSecure, $59.95 per year
Zero-Knowledge Systems
www.freedom.net

Anonymizer 2004

Anonymizer offers a free privacy test that will reveal how vulnerable your computer might be to snoops and hackers.

Anonymizer 2004 is an excellent all-purpose privacy protector that offers two forms of protection from online surveillance.

Install the retail product, and you can attach a privacy toolbar to your Internet Explorer Web browser. Or you can point your Web browser to the company's Website and use their anonymous URL address bar online for free.

Whichever solution you use, your outgoing data will first flow through *Anonymizer's* special servers, which will strip away your IP address before delivering you to your final destination. Both products can encrypt Web-page requests, so there's no record of which sites you visited. In addition to anonymous surfing, the toolbar also prevents tracking and it blocks cookies and pop-ups.

We liked the ease of use and simplicity of both solutions, although we discovered that the *Anonymizer* toolbar doesn't always get along with other browser toolbar add-ons. If you're using the Google toolbar, for example, we recommend turning the Google product off before installing the *Anonymizer* toolbar. Aside from that, we found *Anonymizer* to be a terrific tool.

If you want more protection than anonymous surfing can provide, look into Anonymizer's *Total Net Shield.* This suite of privacy products does everything that Anonymizer does; plus, it includes tools for encrypting your email and instant messages, as well as blocking spam, pop-ups, and more.

Anonymizer 2004, $29.95 per year
Total Net Shield, $99.95 per year
Anonymizer
www.anonymizer.com

TIP FREE PRIVACY TESTS

Want to see how much information someone can glean from you, your computer, and your presence on the Web? Check out the free online tests available from these software publishers:

Anonymizer, Inc.
(look for "Free Privacy Test")
www.anonymizer.com/

Gibson Research Corp
(look for "Shields Up")
www.grc.com

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GhostSurf Pro

A standalone sentry that doesn't use a toolbar to work within Internet Explorer, Netscape, or Opera, *GhostSurf Pro* not only masks your Internet tracks, it also blocks pop-ups, disables spyware, and tells you exactly what data is entering and leaving your Web browser.

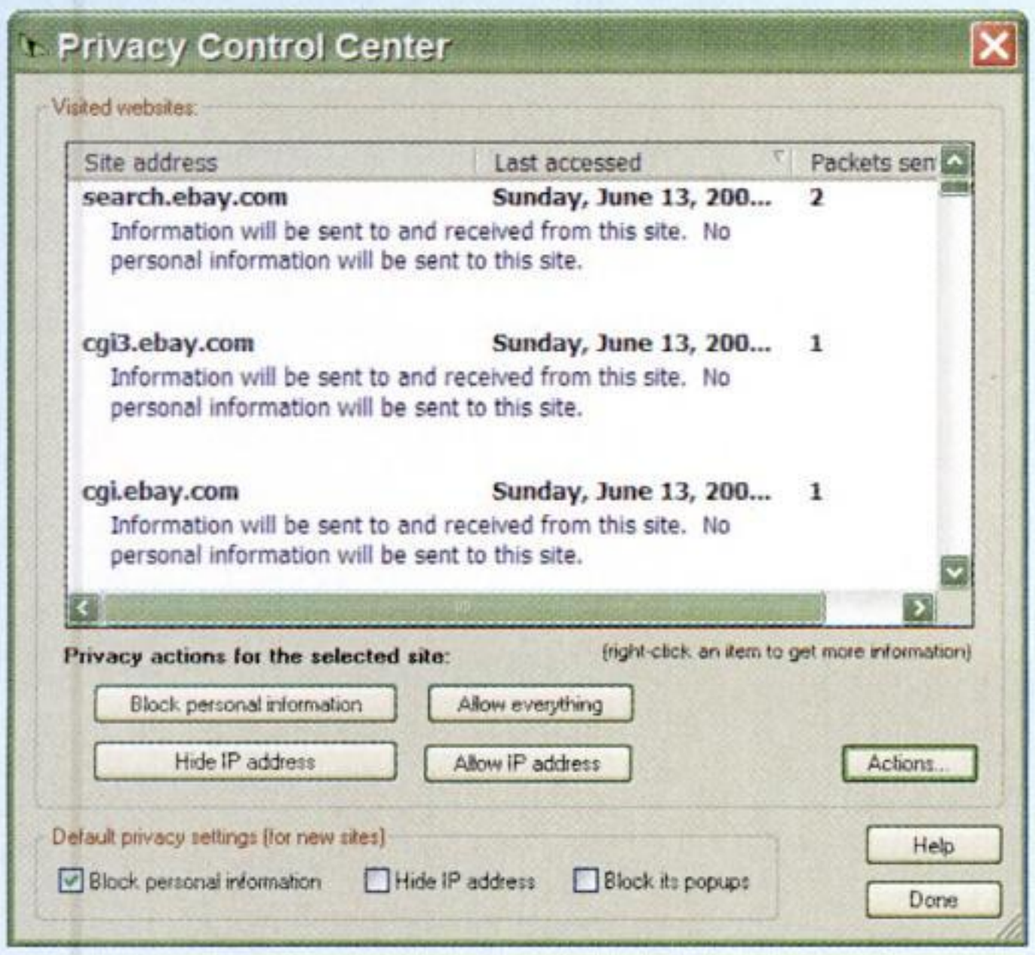
Once installed, double-clicking the GhostSurf icon on the system tray opens the Privacy Control Center. From here, you can see the intimate details of every site you've surfed: Which ones can access your personal information, which cannot, where pop-ups were blocked, and where pop-ups were allowed. You can also block or allow the release of personal information and block or allow pop-ups on a site-by-site basis.

Have you ever encountered an unfamiliar URL, where only an IP address is displayed in IE's address window, instead of the name of the Website? *GhostSurf Pro* can reveal the site's secret identity by searching the Whois database, a registry of every Website domain on the Internet.

Wanna see what might already be lurking on your PC? Right-click on the *GhostSurf Pro* icon, select Tools, and then SpySweep to scan your PC's memory, Windows registry, and hard drive. The program will produce a tattle-tale report for you. You'll need to take care when wielding this tool, however, because although it's powerful enough to detect, disable, and delete any spyware it finds, you can't undo any changes if you delete something crucial by accident.

GhostSurf's Trace Viewer will reveal any files and cookies a site leaves on your hard drive during your visit, so you can mark them for deletion. GhostWipe, meanwhile, can erase all traces of where you were on the Web and what you were doing. The utility will delete your Web browser's History file; any recent documents read, programs run, and pictures viewed; and any recent cookies.

GhostSurf Pro, $39.95
Tenebril
www.ghostsurf.net



***GhostSurf Pro* enables you to establish specific rules for each Website you visit, so you can elect to provide personal information to some and deny it to others.**

Public Safety

If you've ever used a public PC in a library or Internet café, in a business, or at a friend's house, you've left behind plenty of telling tidbits about yourself. Most browsers can store a record of almost anything typed into a Website form or search engine, including names, addresses, passwords, and keywords. If you don't erase them, whoever uses the computer next can easily access the cookies, surfing history, temporary files, and even files you might have deleted.

In an effort to preserve your privacy, you could open the computer's browser, find all this information and delete it (provided you know everywhere to look), and then empty the Recycle Bin. But wouldn't it be simpler if you didn't leave those files on that computer in the first place?

One way to surf the Web without leaving tracks on someone else's computer is to plug the StealthSurfer into one of the computer's USB ports. The StealthSurfer is basically a tiny USB memory device with a built-in Web browser (Netscape, not the more common Internet Explorer) and stealth software. Launch the browser and begin surfing the Web, and it will store all traces of your travels (downloads, cookies, history, etc.) on the memory contained inside the device, instead of on the host computer's hard drive.

Since the browser is operating from a relatively slow USB-memory device, instead of your computer's much faster hard drive, you will experience a slight degradation in browser performance. But you can use any of the device's memory that's not consumed by the browser and temporary Web files to store documents, photos, email, and anything else you might need to carry with you. The device is password-protected, too, delivering yet another layer of security.

The StealthSurfer is available with four memory capacities, ranging from 128MB to 1GB of memory.

StealthSurfer, $99.95 to $279.95
StealthSurfer
www.stealthsurfer.com

Use the *StealthSurfer* and you'll never leave traces of your Web travels on any computer you plug it into.

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How To...

A step-by-step guide to tweaking your PC Experience

DEFLECT, DETECT, AND DESTROY Spyware

Prevent agents Secret Squirrel and Morocco Mole from burrowing into your hard drive

MAXIMUM PC
TIME TO COMPLETION
24/7
HOURS MINUTES

Forget spam, virus attacks, and Internet hacks. The latest, biggest tech threat is so out of control that security experts can't even agree on what to call it. The only thing they're sure of is that your computer is either already infected with a unhealthy dose of it—or it soon will be.

Experts estimate that as many as 95 percent of the world's computers harbor one or another form of "malware." This new buzzword is a contraction of "malicious software," and it encompasses a rogues' gallery of spyware, sneakware, adware, worms, browser hijackers, Trojan horses, keyloggers, and autodialers—any or all of which can dodge your computer's firewall and anti-virus defenses, and then secretly install themselves without your knowledge and definitely without your say-so.

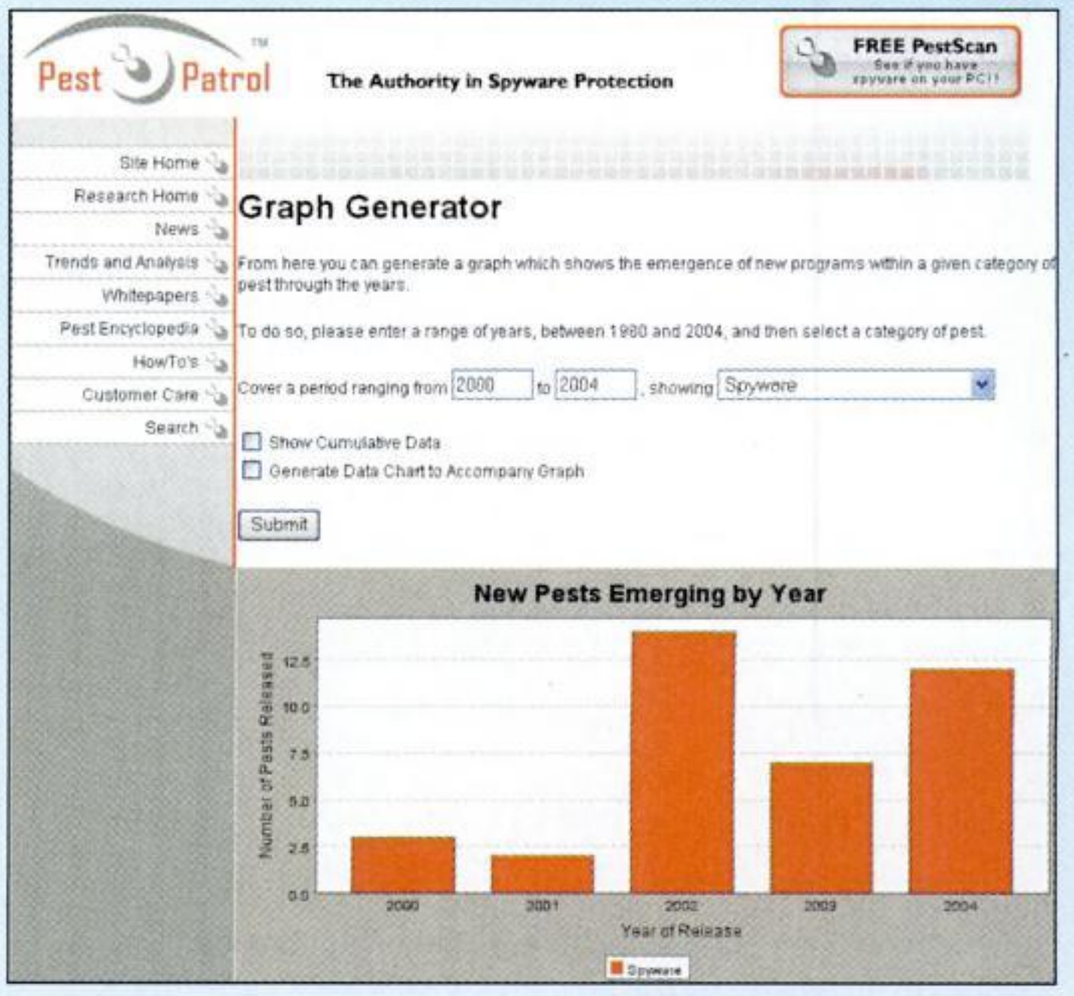
How do you become infected? It's easier than you think. Malware can piggyback onto programs, utilities, screen savers, and other files you download from the Web. Sometimes, it hides inside popular

PestPatrol Home User Edition

When it comes to threat descriptions, *PestPatrol* is in a class by itself. Everything you'd ever want to know about a tagged file—what it does, where it came from, where it's hiding, type of pest (adware, spyware, keystroke logger, etc.), level of severity, risk factor, and delete or ignore advice—is clearly displayed on the screen. For even more information, click the hyperlinked text and you're whisked inside the company's exhaustive online database. PestPatrol, incidentally, makes this information available to all (even if you don't buy the product). Simply point your browser to www.pestpatrol.com.

PestPatrol's interface is very easy to navigate, although some options are a tad difficult to understand at first glance. The program presents so much useful information that you're never left wondering what to do. We do miss having some type of progress thermometer to tell us what percentage of the hard drive has been scanned, or at least a guestimate as to the time remaining. What is most disappointing, however, is the email-only technical support.

PestPatrol Home User Edition, $39.95
PestPatrol
www.pestpatrol.com



According to anti-spyware developer PestPatrol, 2004 was a banner year for spyware threats.

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file-sharing programs, such as *Kazaa* and *Grokster*. Opening spam email attachments or viewing malicious Web pages can also initiate infectious installs.

And in all-too-many cases, you unknowingly grant permission for spyware to take up residence on your PC. How could this happen? If you blindly click on the "I Agree" box without reading a software program's end-user license agreement (EULA), you might miss a shady clause in the agreement that says "third-party software may be installed along with this application."

Wha' Happened?

Once spyware is inside your PC, the damage can take several forms. Some spyware generates pop-up ads. The trickiest mimic Windows dialog boxes, warning that your computer is infected with a virus or spyware. But if you follow

TRAPPING SURVEILLANCE SOFTWARE

Who's watching you? It could very well be someone you know. The most insidious surveillance software is intentionally and clandestinely installed by employers, co-workers, someone else in the family, or "friends."

The most common watchers are called keyloggers—programs that secretly record every single keystroke, email, instant message, and Website visit without your knowledge or consent. Some store the information right on your PC, to be revealed when a secret code is provided. Others send it through the Internet to another computer. And get this: It's kosher in at least two cases.

Your employer, for one, has every right to monitor whatever you do on a company-owned PC. One reason why privacy experts say you should never do anything questionable on a work, public, or remote PC is because it could be trotted out to a jury. Another reason is that—ethics aside—your employer is not legally obligated to tell you if you're being monitored—even if you ask. Your spouse has similar surveillance rights (and vice versa).

How big is the problem? According to Bryson Gordon, senior manager of McAfee Security's product-management group, his company's software has removed more than 1 million keylogger programs since August 2003, when they added specific surveillance scans to their anti-virus, spam, and spyware product line. Privacy experts contend that for every keylogger found, plenty more are still snooping around.

Bugged or not, the only way to be sure is to scan your hard drive with one, if not two, spyware utilities. For best results, run one, reboot, and then run the same one again. Second sweeps find stragglers as well as "keep-alives"—vampire programs that rise from the dead, regenerate, and reinstall themselves.

Now, repeat the same process with a second spyware app. The more counter-espionage tools you employ—anti-virus, firewall, real-time scanners, spam blockers—the better your chances of detecting a stealth keylogger.

McAfee AntiSpyware 1.0

Considering McAfee publishes an arsenal of security utilities, we can't help but be disappointed with their flagship entry in the standalone anti-spyware arena. The barebones interface, while simple and intuitive, contains few options or customizable features. Scanning, detection, removal, and real-time blocking are all first-rate; the Anti-spamware module, however, neither searches for cookies, nor provides any threat information or guidance about what to do with what it has found. Clicking "details" simply takes you to where the alleged threat lives on your hard drive or lists suspicious registry keys—information useless to anyone other than the geekerati. The company says extensive threat levels and descriptions are planned for version 2.0. Our suggestion: Wait and see.

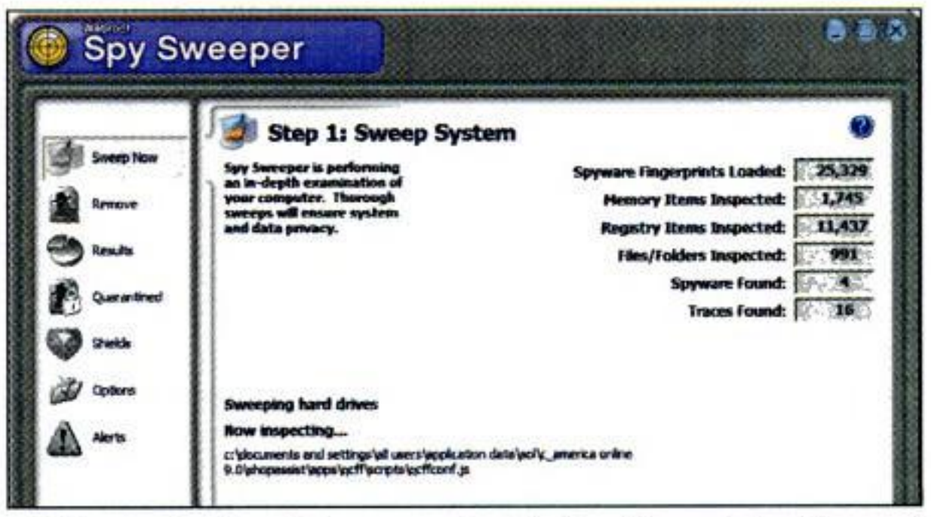
McAfee AntiSpyware, $39.95
McAfee Security
www.mcafee.com

When it comes to anti-spyware solutions, McAfee seems behind the times.

Spy Sweeper 3.0

The just-released *Spy Sweeper 3.0* is a fabulous solution for detecting, deleting, and blocking spyware. It's easy to use, organizes results intelligently, and gives you plenty of information about each threat. This program not only blocks most spyware from sneaking into your PC, it also warns you as it's happening. Even after we ran several other spyware scanners, *Spy Sweeper* was able to find traces the others had missed, thanks to 10 different shields targeting everything from spy installation to Internet Explorer hijacks. The identified spyware was disabled and then quarantined for later review, reinstallation, or permanent deletion. We especially liked the program's "show as it goes" listing of uncovered spyware, adware, cookies, keyloggers, and more in a separate message box. There's an older version (2.6 as of this writing) available for free, which isn't quite as powerful. You also won't get the live updates and toll-free tech support that comes with the retail product.

Spy Sweeper 3.0, $29.95
Webroot Software
www.webroot.com



Webroot's *Spy Sweeper* includes free telephone tech support—a rarity for security software these days.

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its instructions and click the button to "remove" it, you could actually be loading up even more trouble.

Malware might change your Web-browser's home page; allow your computer to be remote-controlled by someone else; or redirect your Web browser to a counterfeit version of such legitimate sites as eBay or PayPal, which will then prey on you to obtain confidential log-in information. Other programs covertly transmit information about your Web-surfing habits to secret servers, which then turn around and bombard your inbox with cleverly crafted email designed to trick you into disclosing passwords, credit-card numbers, and checking accounts.

How can you defend yourself against these attacks? The only way to be sure your PC is not infected—or to gauge how severely it is—is to scan your hard drive with an anti-spyware application. In addition to protecting your privacy, removing spyware programs (many of which run in secret and drain your computer's resources) can instantly improve your PC's performance and speed up your Internet connection.

You'll find a whole collection of freeware, shareware, and trialware on the disc accompanying this issue. And there's plenty more. Here's how to choose the best anti-spyware for you.

Spy VS. Anti-Spy

At a minimum, anti-spyware should detect, isolate, and delete a wide variety of suspicious software already hiding on your hard drive. For it to be effective, you should run it often and update it frequently; otherwise, even a small change in code could be enough to avoid detection.

The best anti-spyware solutions take an aggressive and proactive stance. They'll stop new incursions before they can happen by watching for "spy-like behavior" and then blocking actions such as unauthorized memory or registry changes. Some programs deliver detailed information about identified threats, and some leave it to you to decide what's good or bad.

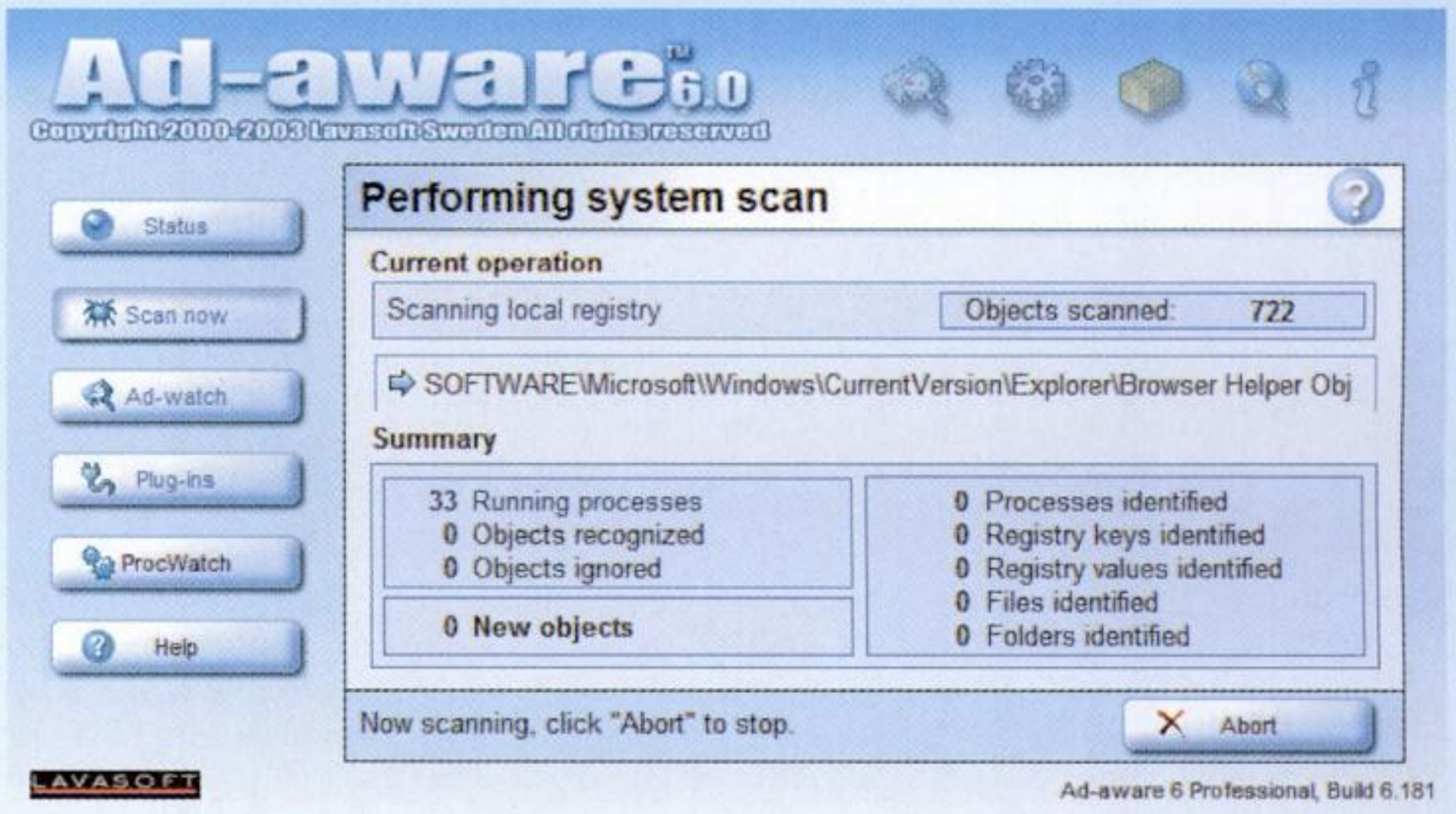
Most freeware and shareware programs include limited or no tech support, which is no surprise considering these products are either free or very inexpensive—but don't make the mistake of thinking they're not good! What's more surprising is that most of the major commercial software developers offer very limited real-time tech support—unless you're willing to pay extra for it.

We recommend using several anti-spyware programs, because no single program is perfect. Some are better at detecting spyware; others are strongest at removing problem programs. We recently took a look at five stand-alone programs. See the boxouts on pages 54-57 for our impressions. (Look on the disc for trial versions of *Ad-Aware* and *Spybot*.)

Ad-Aware 6.0

Available in three flavors—one free, two pay—each version of Ad-Aware detects, isolates, and removes any unwanted malware, tracking cookies, and other spyware problems that might be lurking on your hard drive. The pay versions include Ad-watch, a real-time detection module capable of stopping suspicious programs from running in memory or changing Windows' registry entries. (Windows XP uses the registry to store information about how your computer is configured.)

Ad-Aware was the easiest-to-use product we reviewed, but it doesn't provide much detail about the threats it detects. Context-sensitive help could also be better, and only subscribers get free email technical support.



Lavasoft's *Ad-aware 6* is one of the most effective anti-spyware programs. We've included *Ad-aware Standard Edition* on this month's disc.

Ad-Aware Standard Edition, free
Ad-Aware Plus, $26.95
Ad-aware Professional, $39.95
Lavasoft
www.lavasoftusa.com

Contact Info

Privacy Rights Clearinghouse
www.privacyrights.org

Electronic Privacy Information Center (EPIC)
www.epic.org/privacy

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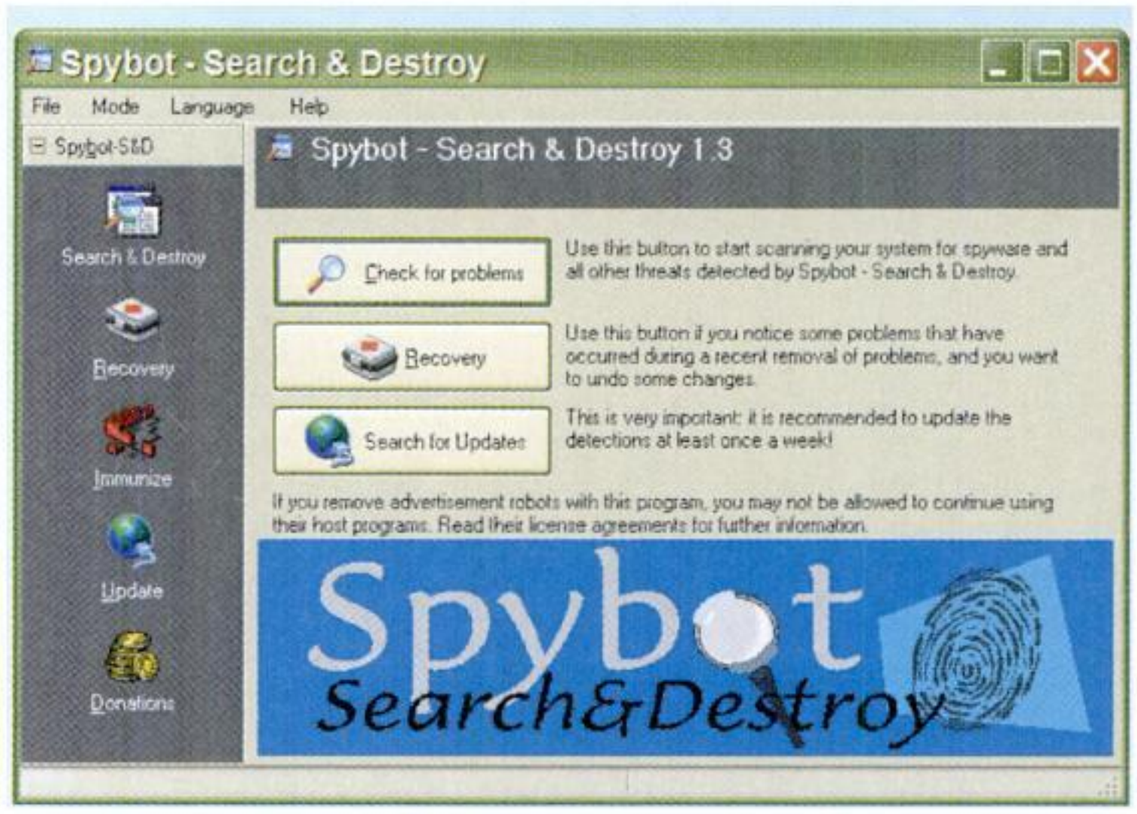
Spybot Search & Destroy 1.2

Spybot Search & Destroy **isn't as easy to use as the *Ad-Aware* series, but it's still a terrific anti-spyware solution. Best of all, it's free! (The author does appreciate donations to offset ongoing development and support costs.)**

Once installed, *Spybot* defaults to its Easy mode, which is fine for most users. In this mode, you're presented with options for scanning (looking for threats), cleaning (deleting identified threats), immunization (preventing known threats from jumping into your computer in the first place), update (to make sure you're always using the most current threat definitions), and rollback (in the unlikely event that removing something the software has identified as a threat has unpleasant consequences).

We wish *Spybot's* scan results ranked threats according to seriousness, instead of lumping them all together; and that more detailed information was available about identified threats. Without this info, it was difficult to decide which files—if any—we should keep and which should be nuked. Still, this is an excellent tool.

We've included *Spybot Search & Destroy* on this issue's disc, so you can try it out for yourself. As with most security products, make sure you download any updates for best results.



Install more than one anti-spyware program, in case one picks up a threat the other misses. PepiMK's *Spybot Search & Destroy* is a perennial favorite.

Spybot Search & Destroy 1.3,
free (donations accepted)
PepiMK Software
www.safer-networking.org

I SPY WITH MY LITTLE EYE

If you do find that a keylogger has been surreptitiously installed on your PC, how do you go about identifying the culprit who put it there? You'll find a clue in the type of keylogger.

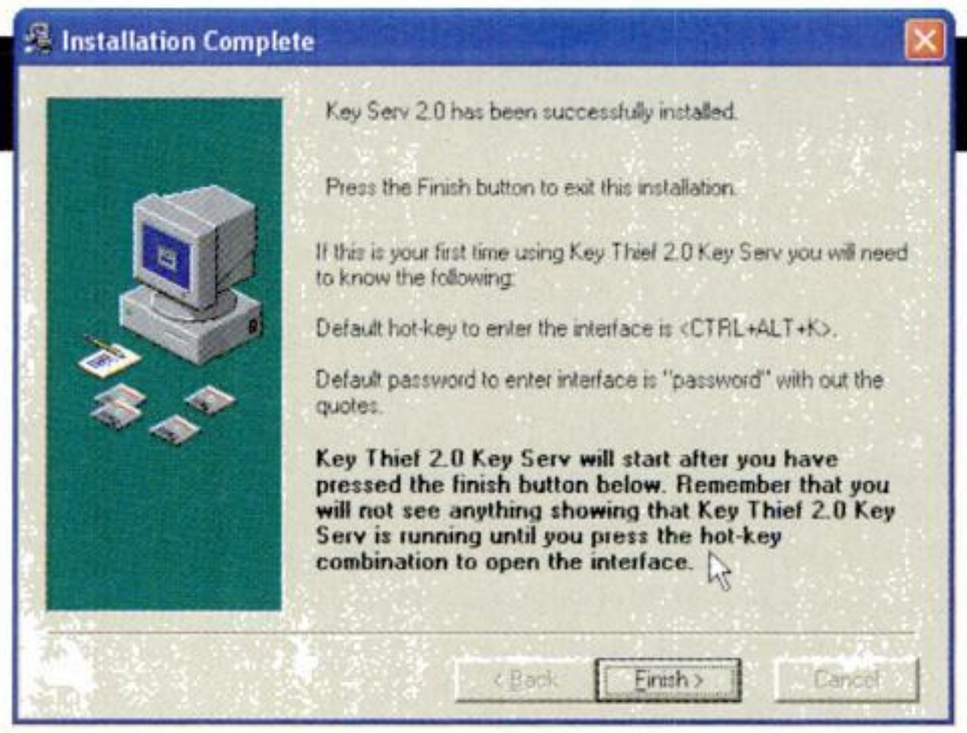
System monitors—such as UKVideo, MoM, ABC KeyLogger, and Key Thief—are typically associated with hackers. If you discover one of these programs on your office computer, alert the IT department.

The presence of commercial software—programs such as *Boss Everyware*, *System Spy*, *Spector Pro*, *WinWhatWhere*, and *Winvesitgator*—tells a different story. If you detect one of *these* programs on your office PC, it might not be in your best interest to disable it or even to let your boss know you're aware of it. We recommend that you look into your privacy rights before taking any action. The Privacy Rights Clearinghouse and the Electronic Privacy Information Center are two excellent resources (see contact-info box at left).

If you find a keylogger on a home computer, use one of the programs discussed in this story to get rid of it. You'll also want to determine who put it there; otherwise, it might just reappear. It's entirely possible, of course, that someone (including you) unwittingly allowed the spyware to be installed—so don't fire off accusations against your spouse or your kids until you know all the facts.

Compared to tracking down and deleting the guilty party from your life, tracking down and deleting a keylogger is relatively straightforward, if a little time-consuming. You should, of course, run one or more anti-spyware programs, but even if the program identifies and deletes or disables the keylogger, we recommend contacting the keylogger publisher (if it's commercial software) and asking for their help to ensure that all vestiges of it have been destroyed. Most publishers will help you if their product was installed illegally or inappropriately.

If they refuse, visit their Website and look for ways to summon the program out of stealth mode and uninstall it. If you still can't find or remove the program, your only recourse might be to back up all your data, reformat your hard drive, reinstall Windows and all your applications, and then restore all your data files.



Programs like *Key Thief* can hide their presence so you'll never know they're there.

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How To ■ ■ ■ A step-by-step guide to tweaking your PC Experience

INSTALL A PERFECT Wireless Network

Anyone can add a wireless network to their home quickly and easily. But if you do it the *Maximum PC* way, you'll own the fastest, most reliable, and most secure network on the block

Without a doubt, wireless networking is the easiest way to share Internet access. And finally—*finally*!—the technology has emerged from the realm of the mundane corporate IT weenie to occupy the living rooms of regular folks. Anyone who wants Internet access throughout his or her house, or who's fed up with the Ethernet cables running into the living room for his or her game console, can use Wi-Fi.

The Wi-Fi elite don't want you to know this, but all you need to get a wireless network running is an access point (AP) and a wireless card. Most wireless access points also include a router, which lets you share a single Internet address with all the computers in your home. It's really that simple. If you still need some more reassurance, turn to page 60, where we show you everything you need to know to get your network up and running.

Although the new generation of wireless devices (more on them later) are a snap to configure and use, setting them up can still be intimidating to the uninitiated. And if something goes wrong—well, look out. If you're having trouble getting your wireless network up and optimally running, we've included a troubleshooting guide on page 64.

And no Wi-Fi setup is complete unless you've taken the time to secure your connection from evildoers. After all, you don't want your neighbors to mooch off of your expensive broadband connection just because you didn't read our security guide on page 65.

Ready to learn about wireless? Turn the page and we'll hook up your hardware, optimize your network, and get you on the road to wireless bliss.

Browse the net from anywhere in your house

This is the number one reason most people buy into wireless. Whether you're sitting on your couch or lounging in bed, you can still connect to the Internet. It's so handy, it's hard to imagine a time when there wasn't a laptop in the living room.

Shut out Wi-Fi banditos

Protect your wireless network from would-be Wi-Fi thieves by enabling WEP and preventing unknown wireless cards from connecting to your network. By using the Cantenna Wi-Fi booster (**www.cantenna.com**, $20), broadband thieves can pick up wireless signals from several hundred feet away. Don't be a victim.

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Position your access point carefully

We mounted our access point on the central wall of the house. By mounting it vertically, we send most of the signal into the areas where we most need it—the downstairs bedroom, our office, and the living room on the other side of the wall.

Make any printer a wireless network printer

Using a handy $150 wireless print server, you can transform any USB printer into a network printer. In other words, you can print from any PC in your home and hide the printer in an out-of-the way location. The model pictured here is the SMC 2621W-U, which uses the 802.11b protocol. Alternatively, you can hang your printer off your central PC.

Watch out for wireless obstructions

Beware of walls that are made of cinder blocks, have steel studs, or contain a lot of pipes. These materials absorb and reflect radio waves, and will interfere with your signal.

Avoid naughty appliances

In addition to potential pitfalls built into the structure of your home, some appliances can also cause problems. Beware of refrigerators and microwave ovens in particular.

Connect everything in your living room

Without wireless, connecting a game console to the Internet is an exercise in frustration, and an OSHA-level work hazard. With a wireless bridge and the appropriate wireless gear, you can connect your consoles and even stream music, photos, and video from your main PC—all without wires.

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1 Set Up Your Wireless LAN the Right Way

Get your installation or upgrade right the first time with these tips, and you may never have to do it again!

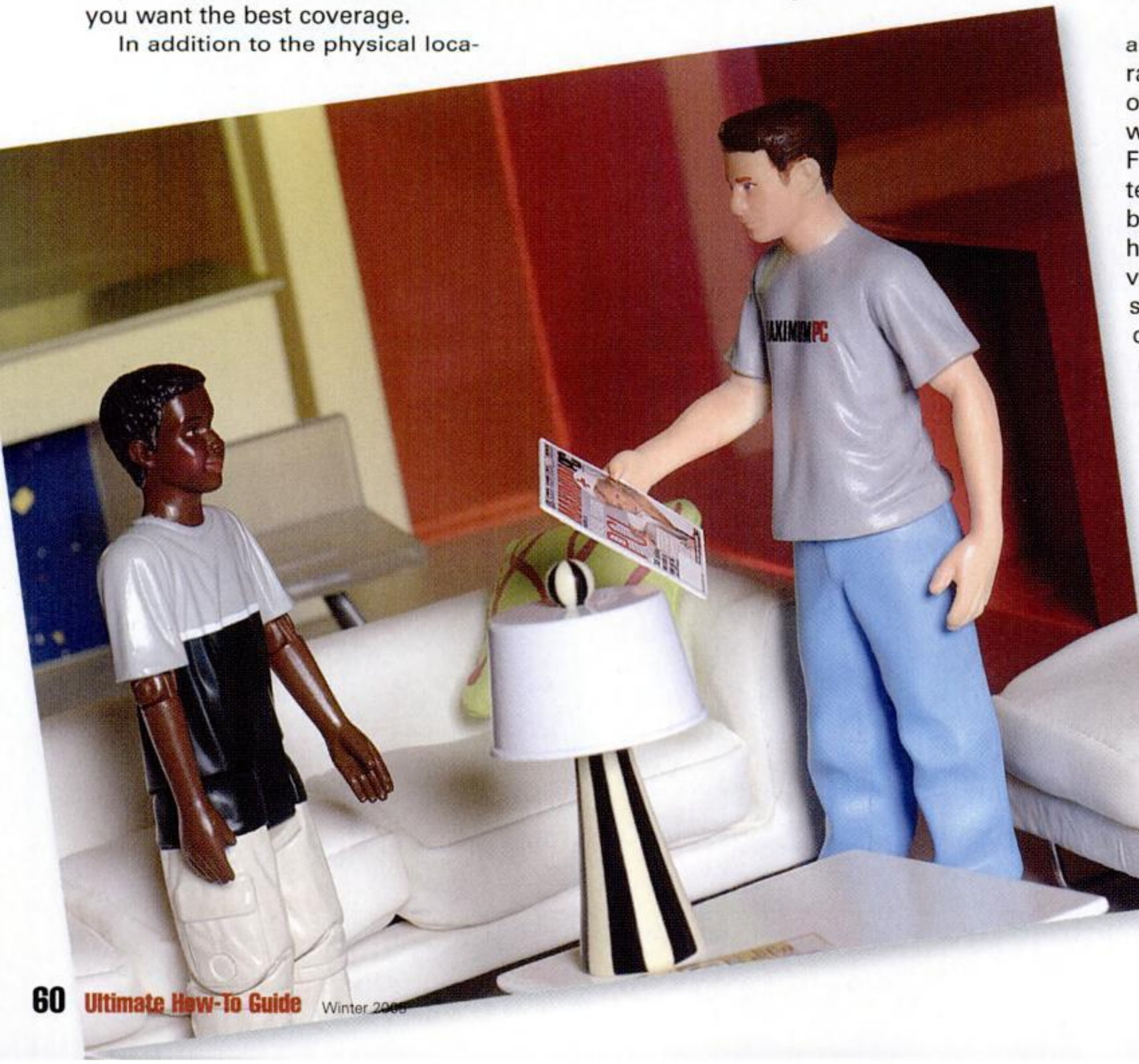
Nine times out of 10, setting up a wireless network is so simple, a baby could do it. However, the one time problems arise, they're usually more complex than a William Gibson novel. We've seen Cisco-trained engineers scratch their heads in dismay after a Wi-Fi install gone awry. The vast majority of problems can be avoided altogether—if you follow a few simple tips when you set up your network.

Proper placement is a virtue

Whether you purchase a fully fledged router and plan to use it to share your Internet connection with all the PCs in your home, or you simply connect a wireless access point to your existing wired network, the most important thing you need to consider is the placement of the wireless AP in your home. When situating your access point, it's important to understand that the coverage area won't be a perfect sphere. Instead it will be flattened, with the access point in the center. Ideally you should place your AP near the center of your home, on the same floor where you want the best coverage.

In addition to the physical location of your access point, beware of typical signal-killing pitfalls. Anything dense can impede reception. In most homes, this means concrete and metal walls, but we've even seen densely packed bookshelves ding Wi-Fi performance. Many appliances, such as refrigerators, ovens, microwaves, or anything with an electric heating element or compressor, create strong electric fields that adversely affect your signal quality.

Once your AP is installed and configured according to the manufacturer's directions, test the reception in different areas of your home. You can use a fancy Wi-Fi signal meter, but a Wi-Fi-equipped laptop works just as well. If your card comes with site survey software, you can use it to measure your wireless network's signal strength in different areas of your home. If it doesn't, you can use the monitor that's built into Windows. Go to Control Panel, then Network Connections, then right-click your wireless network card and go to Status. Take the laptop to each room you'll want to connect from, and check the signal meter. Green and even yellow signals are acceptable, but any signal in the red will work inconsistently, which will quickly become annoying.



Say no to low signal strength

You have several options if you've got the low-signal-strength blues. The easiest and cheapest trick is to relocate or reorient the access point. Leave your test laptop in the trouble spot, then move your AP a few feet and recheck the signal strength in the trouble spot and the rest of the house. (Make sure you check your other points as well before you make the new location permanent.)

But what happens if relocating the access point does no good? If you've tried several different rooms and have avoided every potential trouble spot, you may need to purchase some additional hardware. Signal boosters and repeaters will add range to your wireless LAN, but in slightly different ways. Most signal boosters are vendor-specific, and connect directly to your access point, expanding the range it covers.

Repeaters, on the other hand, add another coverage bubble to your LAN's range. They usually work with any brand of access point, and can be placed anywhere within your existing coverage area. For about the same price, we've had better luck using repeaters instead of signal boosters. It seems the hardware vendors have found the same to be true, because very few companies are still producing signal boosters. For best results, we recommend you place your repeater at the edge of your access point's acceptable coverage area, and nearest the rooms that need improved connection quality. We like D-Link's DWL-800 repeater.

In addition to access points, routers, repeaters, and signal boosters, Wi-Fi bridges are useful for connecting wired Ethernet devices to your wireless network. Most bridges available today are used to convert wired game consoles and other consumer electronics devices into wireless ones.

"Hey, Readerman, you look different. Are you using Viagra?"
"No, but my Wi-Fi network is *up* and running!"

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*Creative Sound Blaster Audigy 2 Gamer
*16X Double Layer DVD -/+R Recorder

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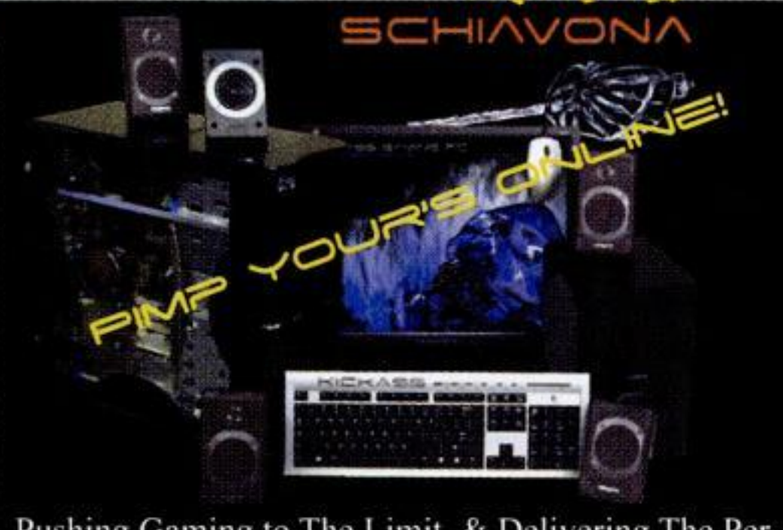

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*PC2-4300 DDR 2 Dual Channel 1024MB Kit
*PCI-Express FX6800 256MB
*Creative Sound Blaster Audigy 2 Gamer
*500GB RAID 0, 8MB 7200 RPM Serial ATA
*16X/48X CD/DVD Internal IDE Drive
*52X32X52 CD-RW Internal IDE Drive
*Microsoft Windows XP Professional

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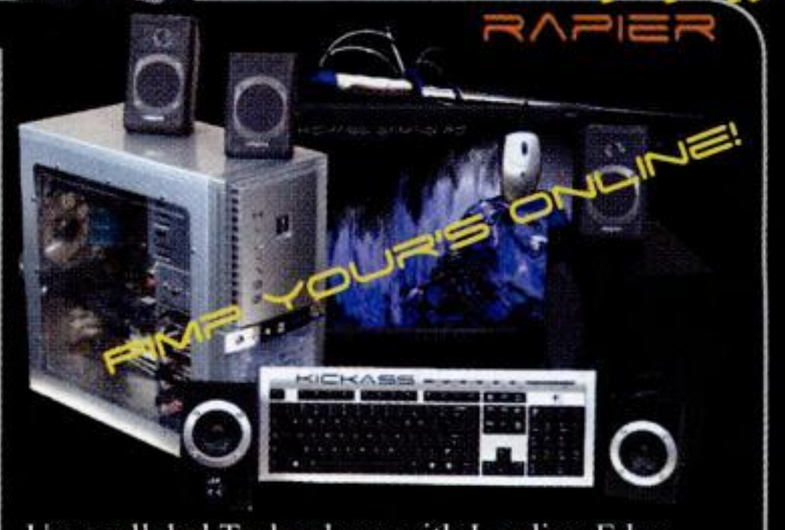
RAPIER



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*Microsoft Windows XP Home Edition

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MOTHERBOARD

INTEL

Socket 478					
Asus	P4R800V/D	$89/109	P4P800SE/ED	$115/130	
	P4C800D/ED	$180	P4P800MX	$85	
Intel	D875PBZLK	$169	D865PERLX	$110	
MSI	MS-6728	$92	865PENEO2PFISR	$139	
	865PENEO2PLS	$83	865PENEO2V	$85	
Socket T (LGA 775)					
Asus	P5AD2P/D	$279/249	P5GD2-P/D	$255/225	
Intel	D915PBLL/PCML	$175/125	D925XCLK/VLK	$219	
MSI	915NEO2PLAT	$179	925XNEOPLAT	$219	
	915GCOMBOFR	$159	915PCCOMBOFR	$149	

AMD

Socket A					
Asus	A7N8X/ED	$89/109	A7V8X/X	$95/65	
	A7V400MX	$65	A7V600	$85	
Socket 754					
Asus	K8VSE-DELUXE	$139	K8N-E DELUXE	$145	
Socket 939 (64 Bit)					
Asus	A8VDX/WIFIG	$139/169	Abit AV8	$130	
MSI	K8NNEO2PLAT	$155	MSI K8TNEO2FIR	$139	

PROCESSORS

INTEL

Socket 478					
2.8GHz	BX80546PG2800E	$199	2.5GHz	BX80546RE2533C	$90
3.0GHz	BX80546PG3000E	$209	2.6GHz	BX80546RE2667C	$95
3.2GHz	BX80546PG3200E	$245	2.8GHz	BX80546RE2800C	$115
3.4GHz	BX80532PG3400D	$339	2.9GHz	BX80546RE2933C	$135
Socket T (LGA 775)					
2.8GHz -520	1MB	$189	3.4GHz-550	1MB	$309
3.0GHz -530	1MB	$199	3.6GHz-560	1MB	$469
3.2GHz -540	1MB	$249			

AMD

Socket 754					
A64 3000+	ADA3000AX	$179	A64 3400+	ADA3400AX	$309
A64 3200+	ADA3200AX	$219	A64 3700+	ADA3700BOX	$549
Socket 939					
A64 3500+	ADA3500AW	$315	A64 4000+	ADA4000AS	$895
A64 3800+	ADA3800AW	$689	A64 FX-53	ADAFX53BOX	$895

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OCZ25331024VDC-K	PC2-4200 1GB DUAL DDR2 KIT 533MHz	$359
OCZ25332048VDC-K	PC2-4200 2GB DUAL DDR2 KIT 533MHz	$729
TWIN2X1024-5400XLP	PC-5400 DDR2 PRO 1GB W/LED 667MHz	$429
TWINX1024-3200XLP	PC-3200 PRO 2-2-2-5- 1GB XMS3200	$349

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Maxtor	160GB	7200rpm	SATA	6Y160M0	$115
Maxtor	250GB	5400rpm	ATA 133	5A250J0	$209
Maxtor	300GB	7200rpm	SATA	6B300S0	$265
Seagate	120GB	7200rpm	ATA 133	ST3120026A	$99
Seagate	160GB	7200rpm	SATA	ST3160827AS	$129
Seagate	200GB	7200rpm	SATA	ST3200822A/AS	$129/139
WD	120GB	7200rpm	ATA/SATA	WD1200JB/JD	$99/$109
WD	200GB	7200rpm	ATA/SATA	WD2000BB/JB	$125/$135
WD	250GB	7200rpm	ATA/SATA	WD2500JB/JD	$205/$215
WD	250GB	7200rpm	ATA/SATA	WD2500SB/SD	$225/$235
WD	36GB	10000rpm	SATA	WD360GD	$139
WD	74GB	10000rpm	SATA	WD740GD	$209
Hitachi	160GB	7200rpm	SATA	13G0254	$115
Hitachi	250GB	7200rpm	SATA	13G0255	$205
Hitachi	400GB	7200rpm	SATA	0A30229	$425

VIDEO CARDS

ATI

Asus	Radeon X800Pro	$509	MSI	Radeon X800Pro	$479
ATI	Radeon X800Pro	$449	Visiontek	Radeon X800Pro	$429
ATI	Radeon X800XT	$559	Gigabyte	Radeon X600XT	$219
Celestica	Radeon X800XT	$559	MSI	Radeon X600Pro	$179
Celestica	Radeon X800Pro	$449	Celestica	Radeon X600XT	$249

NVIDIA

EVGA	PCX6600 PCI-E	$229	BFG	6800 GT 256MB	$449
Gainward	PCX6600 PCI-E	$219	EVGA	6800 GT 256MB	$449
Gainward	PCX6800 PCI-E GT	$479	Gainward	6800 GT 256MB G.S	$439
Gigabyte	PCX6600 PCI-E	$229	Gainward	6800 GT Ultra G.S.	$549
Gigabyte	PCX6800 PCI-E GT	$489	MSI	6800 ULTRA 256MB	$619
MSI	PCX6600 PCI-E	$239	PNY	6800 GT 256MB	$449

CREATIVE LABS

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Wildcat	Realizm 200 512mb	$1169	Wildcat	4 7210 128MB	$1819

PC GAMES

Activision	Doom 3	$54.99
Activision	Call of Duty	$39.99
Activision	Empires-Dawn/Modern	$29.99
Atari	Unreal Tournament	$39.99
Microsoft	Halo 2	$49.99

MONITORS

NEC	19"	FE990BK	1792x1344	$249
NEC	19"	FE991SB	1792x1344	$279
NEC	21"	AS120-BK	1792x1344	$459
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V'SONIC	19"	E90FB-2	1600x1200	$219
V'SONIC	19"	P95F+B-2	1600x1200	$269
V'SONIC	22"	P220FB-3	2048x1536	$589
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V'SONIC	21"	VP211B	1600x1200	$1369

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Creative	Audigy 2 ZS Platinum	$179
Creative	Audigy 2 ZS Platinum Pro	$229
Gainward	Hollywood@Home™ 7.1	$39

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Creative	GigaWorks S750 7.1 Surround	$429
RWTI	5.1 Gaming Speaker Blue/Green/SLV	$189
Logitech	ProLogic II 5.1 Z680	$239

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Thermaltake	Liquid Cooling A1681	$229
Zalman	Liquid Cooling Reserator1	$219

www.KickAssGamingpc.com

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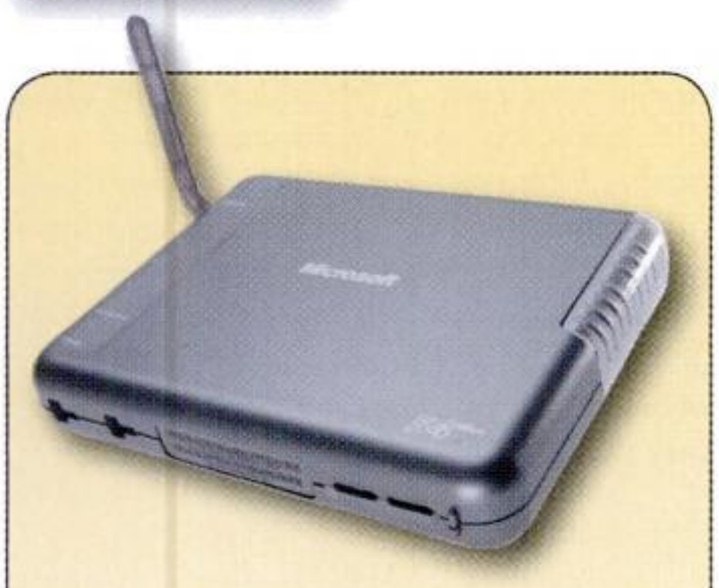
2 Buy the Best Products

From access points to routers to webcams, here's the Maximum PC-approved list of the best Wi-Fi gear for every category. Our verdicts are law!



Easiest Router to Install
Microsoft Wireless Base Station MN-700

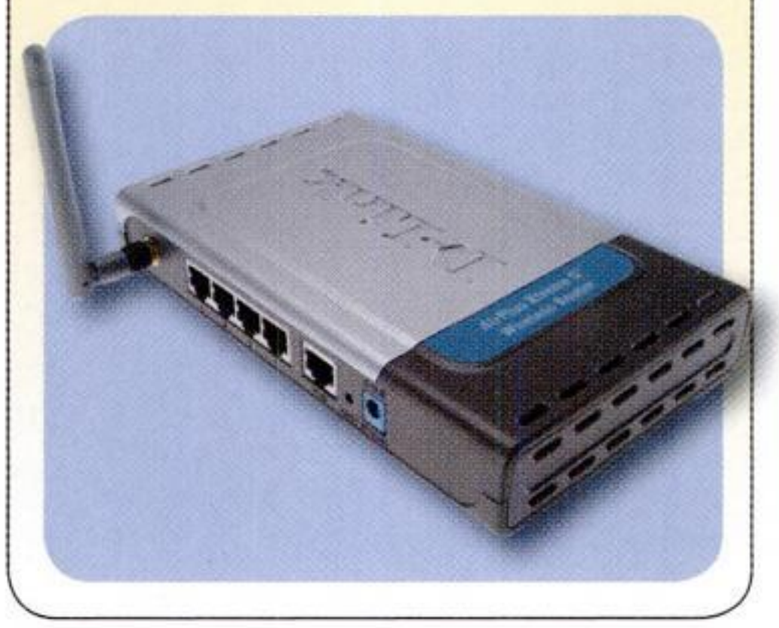
This 802.11g router is more enjoyable to configure than any other router we've ever used. It walks even the rankest neophyte through the Wi-Fi configuration process, helping you choose the correct settings for security and reliability. This integrated four-port hub even lets you share your broadband hookup with all the devices in your home, whether they're wired or wireless.

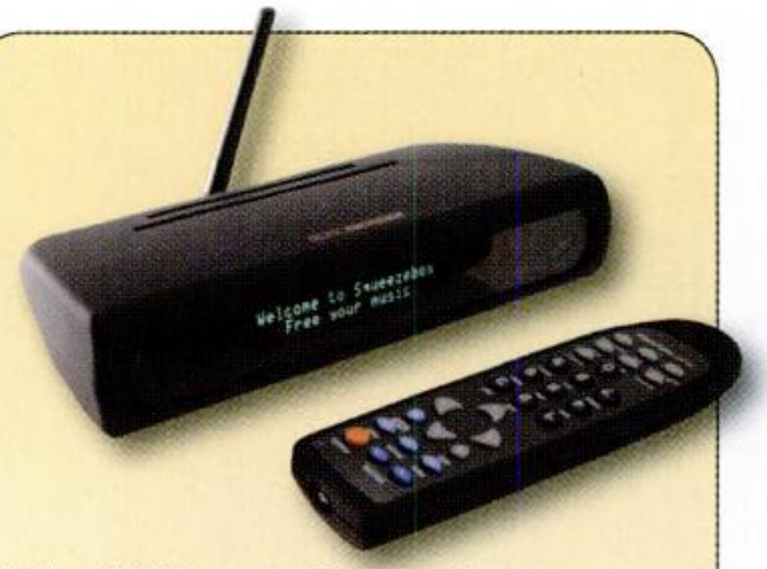
$110, www.microsoft.com/hardware

Fastest Router
D-Link DI-624

By day, the DI-624 is an ordinary Wi-Fi router with a four-port hub that runs at a measly 54Mb/sec. But when you engage its special High Speed mode, it ratchets the speed up to 108Mb/sec by using more of the available spectrum. As long as you'll be using it with other D-Link devices in your home, the DI-624 is the ultimate router for high-speed wireless access.

$120, www.dlink.com

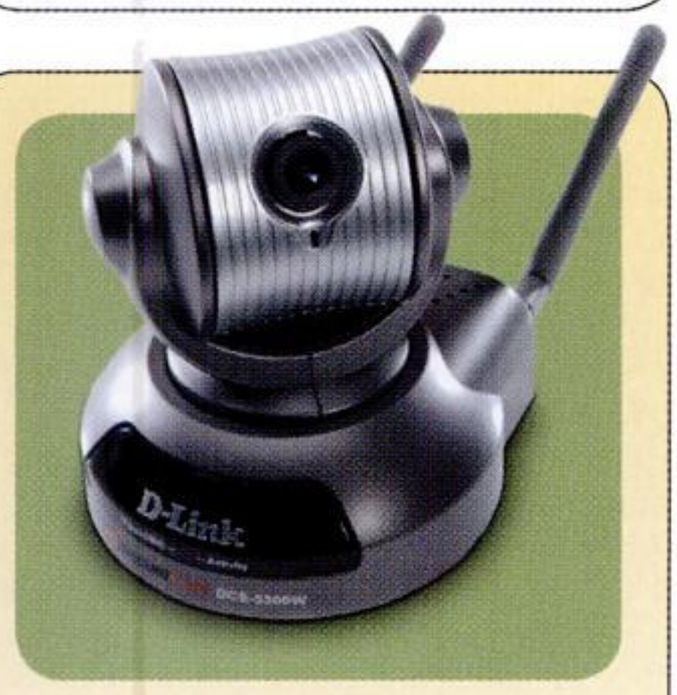




The Ultimate Streaming Media Box
Slim Devices Squeezebox

You've got thousands of MP3s on your PC, but no way to listen to them on the kick-ass stereo in your living room. This common problem is easily solved with a simple Wi-Fi network and the Squeezebox. Setup is easy: install the software on your PC, power up the Squeezebox, connect it to your stereo using either the analog or digital connection, enter your SSID and WEP key, and you're ready to groove. The easy-to-browse interface and web-based configuration tool let the Squeezebox stream much more than just MP3s; it can stream any audio format your PC can play.

$300, www.slimdevices.com



Best Wi-Fi Webcam
D-Link DCS 5300

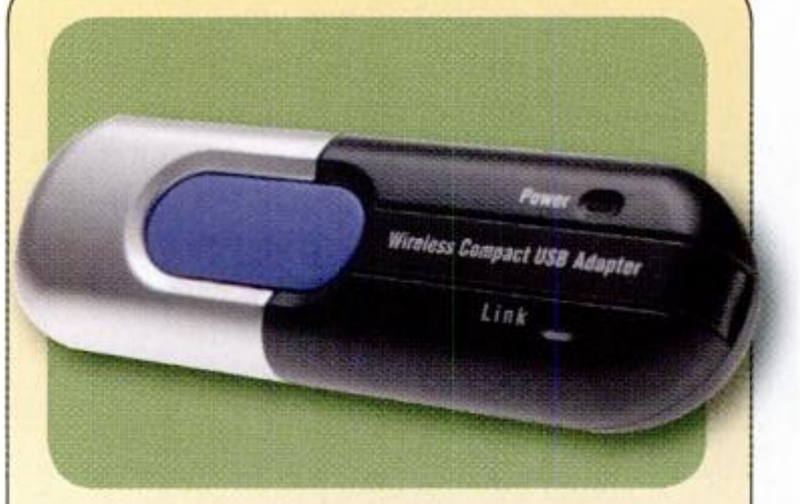
It really doesn't get any simpler than the DCS 5300. You plug it into an electrical outlet, configure it from any Wi-Fi-enabled PC using the provided software, and you instantly have a webcam that you can place anywhere in range of your Wi-Fi access point. It can even stream a 320x240 MPEG4 video at 30 frames per second. It makes for a great little security device.

$300, www.dlink.com

Wi-Fi PC Card

The vast majority of Wi-Fi cards for laptops are virtually identical. Most have about the same performance, cost about the same price, and are made by the same two companies: Broadcom and Intersil. The only reason to choose one Wi-Fi card over another is that some vendors, like D-Link, enable higher-than-standard wireless transfer speeds on only their own hardware. For this reason, we recommend buying your PC cards from whichever company made your access point.

Around $50



Most Portable Wi-Fi Device
Linksys WYSB12

This penlight-size USB dongle adds Wi-Fi in seconds to any PC with a USB port. Its small size and convenient formfactor make it an easily transportable Wi-Fi solution for desktops or any other device with a USB port.

$70, www.linksys.com

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3 Logically Troubleshoot Your Wi-Fi Woes

We present three easy steps to wrangle your Wi-Fi network into working order

Typically, setting up a Wi-Fi network is so easy, a poorly trained dyslexic monkey could have the whole thing up and running in 15 minutes. Of course, those rare instances when everything goes wrong can be frustrating for even a highly trained network engineer. Follow these steps to tackle even the gnarliest Wi-Fi mess.

PROBLEM:

My PC shows a strong signal, but I can't connect to the Internet.

WE SAY:

Three or four factors can cause a connection with no data transfer. First, try upgrading your access point's firmware. We've spent hours trying to configure and re-configure a dead Internet connection, only to discover that a firmware update was all we needed. (The firmware is like your access point's operating system.)

If that doesn't work, check for a misconfigured WEP (wired equivalent privacy) or WPA (Wi-Fi protected access) key. If you have other wireless PCs that are operating properly on your network, re-enter your WEP or WPA key on the machine that's not working.

If you live in an apartment complex with several other wireless access points, you may need to prevent your PC from connecting to other APs. Go to Start, Control Panel, Network Connections, then right-click your wireless network card and choose Properties. Go to the Wireless Network tab, then click the Advanced button and ensure that "Automatically connect to non-preferred networks" is not checked.

The final potential pitfall is an IP address misconfiguration. Go back to the Network Connections Control Panel, right-click your wireless network card, and then select Status. Go to the Support tab and check the IP address. For most IP addresses, the address type should be listed as "Assigned by DHCP." If that field lists "Auto-configuration IP address," it's easy to fix: Just press the Repair button to get a current dynamic address.

If the address-type field says "Static IP address," you'll probably need to change it to dynamic. First click Network Connections, and press Properties. Click the General tab, then double-click the Internet Protocol item. Make sure that "Obtain an IP address automatically" and "Obtain DNS server address automatically" are checked.

PROBLEM:

My access point is on and configured, but my wireless computer says there's no available wireless network.

WE SAY:

First, try moving your computer closer to your access point. If you're sitting three feet away from the AP and don't have a connection, either your device or the AP is misconfigured. Make sure your access point and PC are using the same type of security, either WPA or WEP. You also need to ensure that the security key is the same on the AP and the PC.

Make sure your card and access point are using the same spec. While 802.11g is backward-compatible with 802.11b, some access points allow the user to lock the AP into 802.11g-only mode, preventing connections from older 802.11b hardware.

If you've checked the security and compatibility settings, but still have no connection, check your AP manufacturer's web site for a firmware update. Many times, incompatibility issues between access points and wireless networking cards can be quickly resolved with firmware updates.

PROBLEM:

I've tried everything above, but I still can't connect to the Internet.

WE SAY:

Either your Internet connection is down, or your router isn't talking to the Internet via your Internet Service Provider. If your access point is built into a router, make sure the router is actually working by plugging a PC into one of the wired Ethernet ports. If you can't connect using the wired port, then your router may be misconfigured. Make sure your router is configured as your ISP recommends. Check the IP address and your PPPoE settings. Some ISPs used to tie your connection to a single MAC (media access control) address, but that's increasingly rare. If you're concerned that there's some ISP funny business going on, check your access point's documentation to see how to clone your desktop PC's MAC address onto your router.

If it still doesn't work, try connecting your PC directly to your DSL or cable modem. If you can connect to the Internet when plugged directly into your modem, then your router is misconfigured. If you can't, contact your ISP to get your broadband connection working properly. ■

IN THE LAB: HOW TO TEST WI-FI PERFORMANCE

We use several benchmarks to test Wi-Fi performance, but the simplest method is to measure the length of time it takes to move a large file from a wired machine to a wireless machine and then back again. We use an FTP server for our tests, but it's entirely acceptable for a home user to just use Windows file-sharing by dragging and dropping files between directories. To test performance, you'll need a stopwatch and a file larger than 200MB. When the file is finished transferring, divide the size of the file by the length of time it took to download. We generally find 802.11g networks transfer at about 1.2MB/sec, or about 10Mb/sec, from a wired to wireless network in a best-case scenario.

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How To...

A step-by-step guide to tweaking your PC Experience

PROTECT YOUR Wireless LAN

Keep the neighborhood snoops, sniffers, and data thieves off your 802.11 network

MAXIMUM PC
TIME TO COMPLETION
00:40
HOURS MINUTES

Every month, you pay five sawbucks for a broadband Internet connection, and your favorite way to savor the lightning-fast downloads is via a wireless Internet connection. But danger lurks in this high-speed, free-range utopia. Just consider how many seedy online guides explain how to get "free broadband" by leeching off someone else's precious Wi-Fi bandwidth!

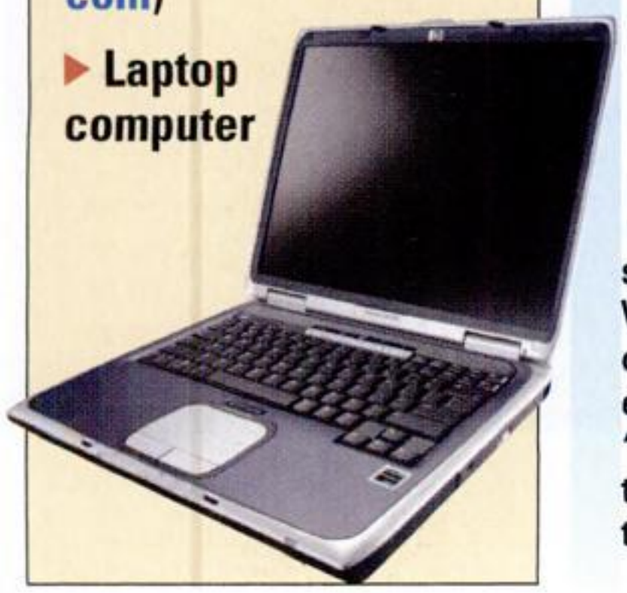
Stolen bandwidth isn't the only problem. Once thieves can leech your net connection, they can also get access to files on your PC, track the sites you browse, and even read your private e-mails and instant messages. Yikes! *It sucks to be you.*

But that's where we come in. We're here to save you from bandwidth pirates and other pimply ne'er-do-wells. Whether you use 802.11b or 802.11g, the precautions for wireless safety are about the same. We'll show you how to lock down your data and minimize the chances that a wireless snooper will leech from your LAN.

Wireless networking entails that every data packet to and from your PC be broadcast over the airwaves, so there's always a chance that someone will be able to sniff your data. If you want to make your LAN 100 percent secure, you'll have to disconnect it from wireless technology entirely. Still, the tips in this article will protect you from all but the most determined miscreants.

What You'll Need

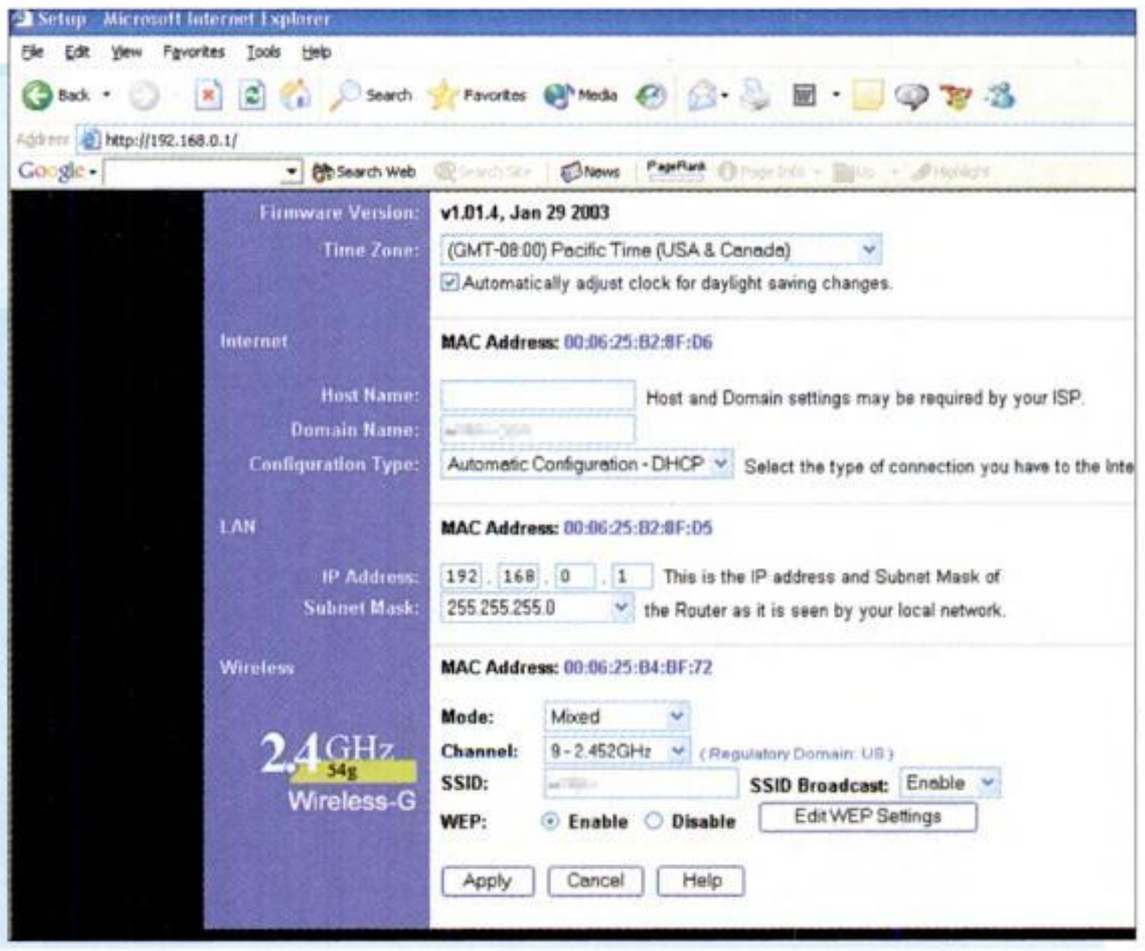
- 802.11b or 802.11g access point
- 802.11b or 802.11g cards to access the LAN
- 100Mbit Ethernet hub
- NetStumbler (www.netstumbler.com)
- Laptop computer



Give Your Network a New Name

Your network's name can actually be a weak spot. In order to gain access to your network, an intruder has to know its name—commonly called an SSID. Most access points from a single manufacturer ship with the same SSID (preset at the factory), and the easy setup programs that come with the hardware don't always encourage users to change the SSID.

What can you do to fix this? Change your network's SSID! Open up the configuration program that was provided with your access point, and change the SSID to something completely unique and obscure. We recommend that you *not* use anything obvious, such as your hardware manufacturer's name, or words like "default," "wireless," "802.11," "network," "home," or anything else that may be easily guessed after just a few tries.



While you're changing the SSID, make sure to change the password for your AP's administration account. No matter how secure you make your AP, it's wide open if a cracker can just log in using the username and password printed in the instruction manual.

Changing your SSID is the first step you need to take, but it's certainly not the end of your lockdown routine.

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Get WEP Working

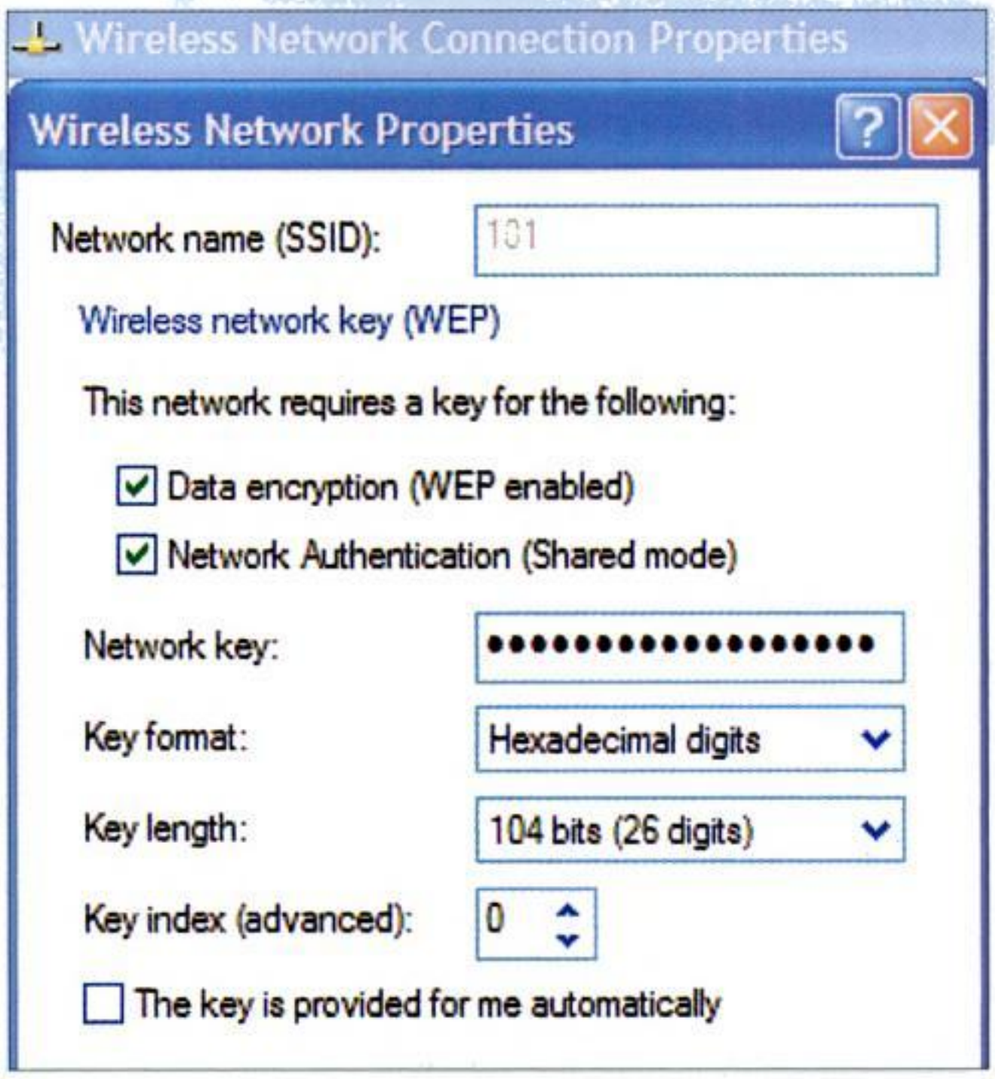
Enabling WEP—wired equivalent privacy—is the second-most important thing you can do to stymie would-be wireless freeloaders. WEP isn't 100 percent secure, but cracking the encryption technology isn't a simple exercise. In fact, it presents more trouble than most common bandwidth thieves are willing to wrestle with.

First things first: If your access point and your Wi-Fi card support 128-bit encryption, use 128-bit encryption. A 128-bit key can indeed be cracked, but even under perfect circumstances, a cracker will have to sniff packets from your wireless network for six or more hours in order to get enough data to generate a WEP key. And we repeat: That's in an *ideal* situation. It can actually take days or longer to sniff enough packets to crack a 128-bit key.

Of course, a 128-bit key won't help you if it's just 1111 1111 1111 1111 1111 1111 11. Interfaces for entering keys will differ from access point to access point. Some APs require that you enter the key in hexadecimal, while others prefer plain ASCII text. Luckily, the Windows wireless control panel lets you enter your key in either format, so make sure you enter the key in the same format in both places!

When you create your key, remember that hex keys can include the digits 0 through 9 and A through F. ASCII keys can be any letter of the alphabet or any number. For maximum security, avoid repetition or any kind of pattern.

If you still don't feel secure enough, check into WPA-based wireless products (see sidebar below). The setup process for WEP and WPA security is nearly identical.



You Gotta Keep'em Separated

Now that your access point is reasonably secure, it's time to separate your networks. By separating them, you'll deny access to your wired LAN even if a cracker manages to break into your wireless LAN. The separation process involves getting a second hub and a second IP address from your ISP, and then setting up a firewall on your wired network.

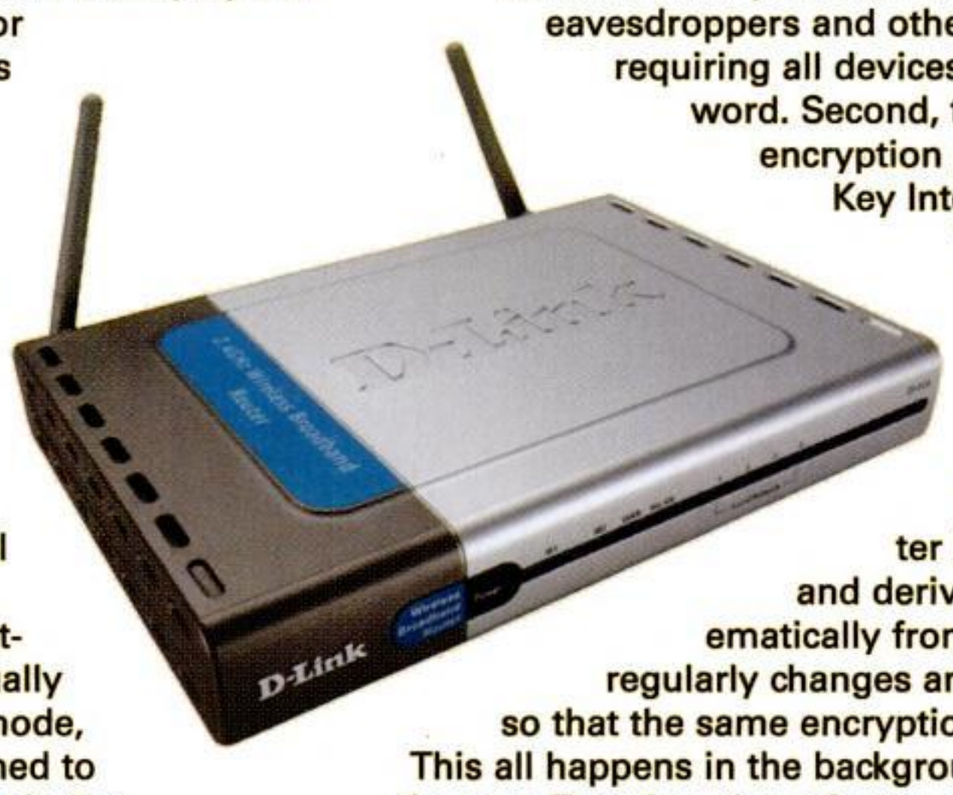
First, you'll need to rewire your wired network. Connect your new hub to your DSL or cable modem, then connect your wired LAN to one port on the hub and your access point to another port. Next, configure your access point with the new IP address. Now you have **two separate networks—one wired and one wireless—running off the same broadband modem.**

Of course, none of this will do any good if you don't have a firewall on your wired LAN, so make sure you at least have *ZoneAlarm* running on your router.

There's a New Wi-Fi Security Kid in Town: WPA

The increasing attention on wireless security issues has the current security standard, WEP, under scrutiny by vendors and customers. The primary reason for concern is that WEP's encryption method is relatively straightforward, and therefore, vulnerable to a determined and skilled hacker. The Wi-Fi Alliance, in conjunction with the IEEE, has driven an effort to develop an improved Wi-Fi security method called Wi-Fi Protected Access (WPA).

WPA runs in two different modes–enterprise and home mode. In enterprise mode, a network server and sophisticated authentication mechanisms are used to automatically distribute special encryption keys, called master keys. In a home environment, where there are no network servers, WPA allows the use of manually entered keys or passwords, instead. This mode, also called Pre-Shared Key (PSK), is designed to be easy to set up, and the process is quite similar to what we've described for WEP. You enter a password (also called a master key) into your access point or home wireless gateway and into each PC that is on the Wi-Fi wireless network. After you enter the password, WPA keeps out eavesdroppers and other unauthorized users by requiring all devices to have the matching password. Second, the password kicks off the encryption process, called the Temporal Key Integrity Protocol (TKIP).



This is where the mechanics of Wi-Fi Protected Access are substantially different from WEP, where the same static encryption key is used over and over again. TKIP takes the original master key only as a starting point and derives its encryption keys mathematically from this master key. TKIP then regularly changes and rotates the encryption keys so that the same encryption key is never used twice. This all happens in the background automatically, invisible to the user. Together, these features make Wi-Fi Protected Access a stronger security solution than WEP.

For more on WPA, go to **http://www.wi-fi.org/opensection/.**

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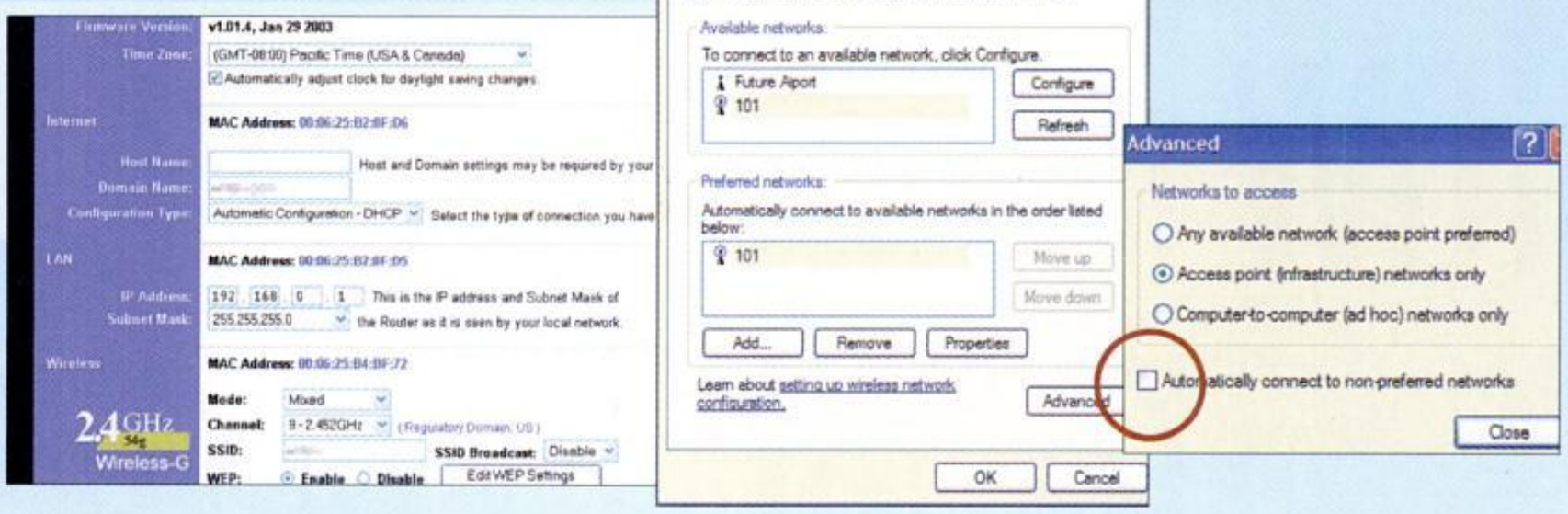
Disable SSID Broadcasting



The SSID is your network's name. By default, most access points are set to broadcast their SSIDs to a compatible Wi-Fi device in the vicinity. So not only can crackers discover vulnerable wireless LANs by driving around with Wi-Fi-enabled laptops, but they can also get network names at the same time!

Most access points, however, include an option to disable SSID broadcasting. It's generally a good setting to disable, but we have had some problems maintaining connectivity when using the Windows built-in wireless configuration interface to connect to Wi-Fi LANs with SSID broadcasting disabled. And this problem is exacerbated if other people in your neighborhood have wireless LANs set up.

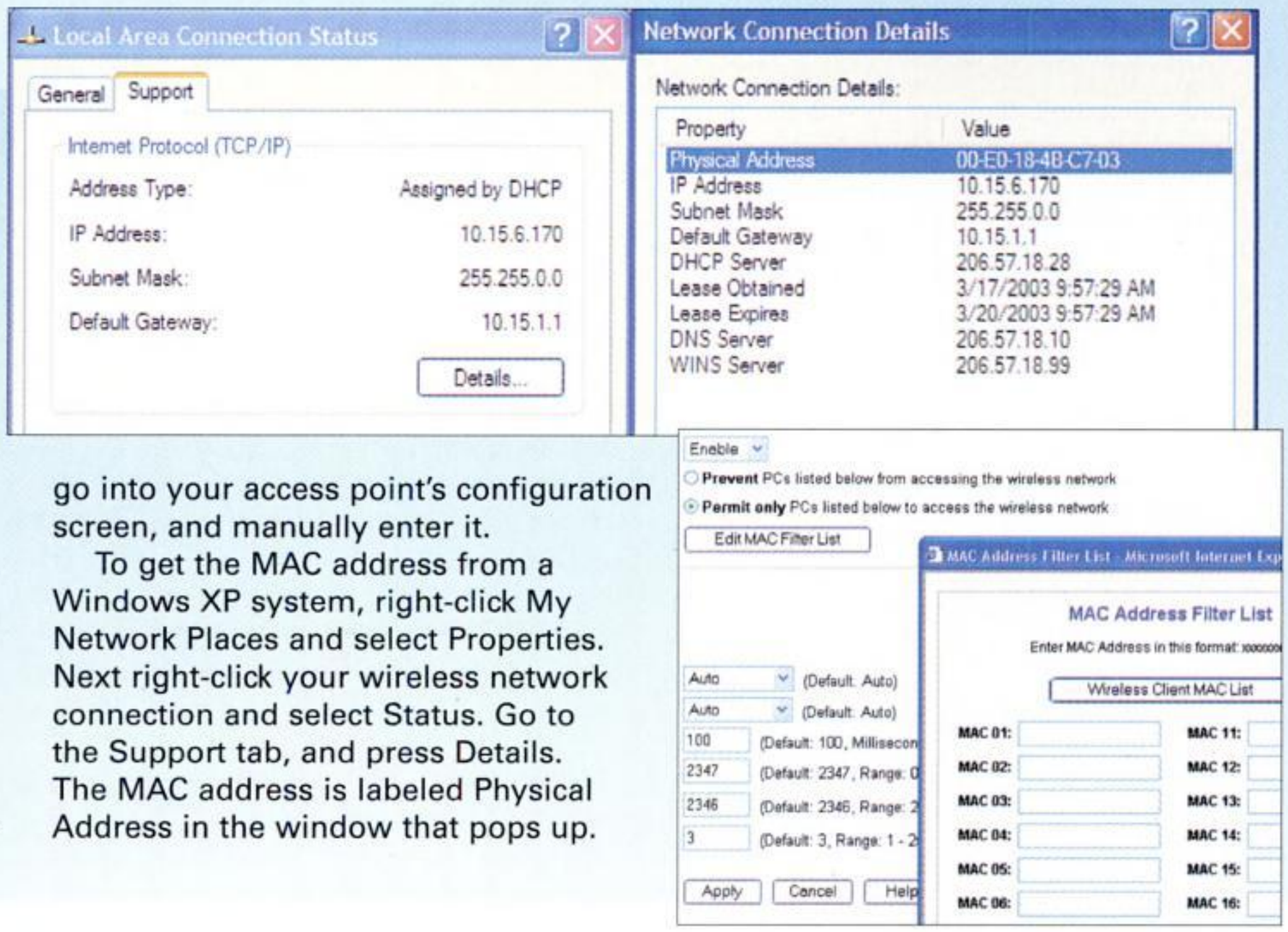
If you're noticing interference after disabling SSID broadcasting, there's a setting you can change to minimize the problem. Right-click My Network Places and select Properties. Now right-click your specific wireless connection, and select Properties. Go to the Wireless Settings tab, and select the Advanced option. Uncheck the "Automatically connect to non-preferred networks" option.

Super Security

Most access points are able to deny wireless access to unknown computers. You see, each network card has a unique number assigned when it's manufactured. This "MAC address" is a 12-digit code, and no other piece of network hardware will share the same code. By telling your wireless LAN to grant access only to network cards that have known MAC addresses, you can prevent unknown users from gaining entry.

Each AP will handle MAC address filtering differently, so you'll need to consult your instruction manual. The Linksys interface is pictured above. Just remember, any time you want to add a new authorized user to your wireless LAN, you'll have to get the MAC address, go into your access point's configuration screen, and manually enter it.

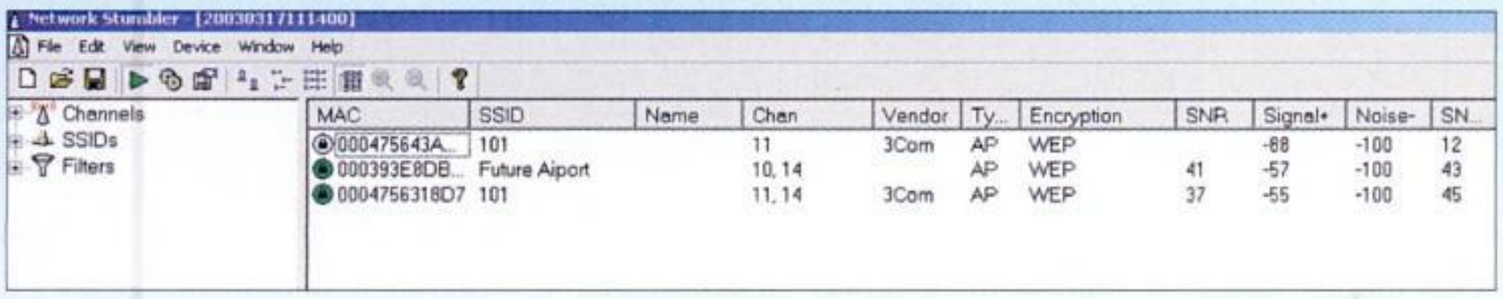
To get the MAC address from a Windows XP system, right-click My Network Places and select Properties. Next right-click your wireless network connection and select Status. Go to the Support tab, and press Details. The MAC address is labeled Physical Address in the window that pops up.



Check Your Back

If you've followed all of our instructions, your wireless LAN should be reasonably secure. If the National Security Agency wants into your wireless LAN, there's not much you can do to stop it, but our tips should keep little Billy next door from using your DSL line to download gigabytes of Trent Reznor MP3s.

Regardless, you should still install *NetStumbler* (www.netstumbler.com) on one of your wireless PCs, and see if your LAN shows up. *NetStumbler* is the most common 802.11 network sniffer. Most likely, it's what your enemies will be using to discover and compromise your LAN. If you configured everything correctly, your access point shouldn't even show up in this utility's window. If you don't see it, the freeloaders probably won't either, and will just move on to easier prey. ■



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How To...

A step-by-step guide to tweaking your PC Experience

Bend Wi-Fi TO YOUR WILL

These nine cool tips and tricks will show you how to use your wireless LAN to perform amazing feats—and revolutionize your wire-free life

Most folks use their wireless networks for nothing more than accessing the Internet in rooms that they don't have wires running to. For shame, we say! You should honor that your cheapo Wi-Fi access point—a piece of hardware that would have cost thousands of dollars just a few years ago—by really letting it strut its stuff. As you'll see shortly, with a properly configured AP, you can do much, much more than just browse the Internet with your laptop .

In order to do some of these tricks, you'll probably need to purchase a little bit of hardware, but we promise you that the results are worth it! All you need to get started is an operating Wi-Fi network—802.11g or 802.11b are best—and you'll be good to go!

What You'll Need

- Tivo Series2 Personal Video Recorder
- Optional Home Networking option (now free through Tivo.com)
- Home network – either wired or wireless
- USB network adapter – either wired or wireless
- PC(s) on network with Tivo Desktop

Use your TiVo to view photos, listen to music, and more!

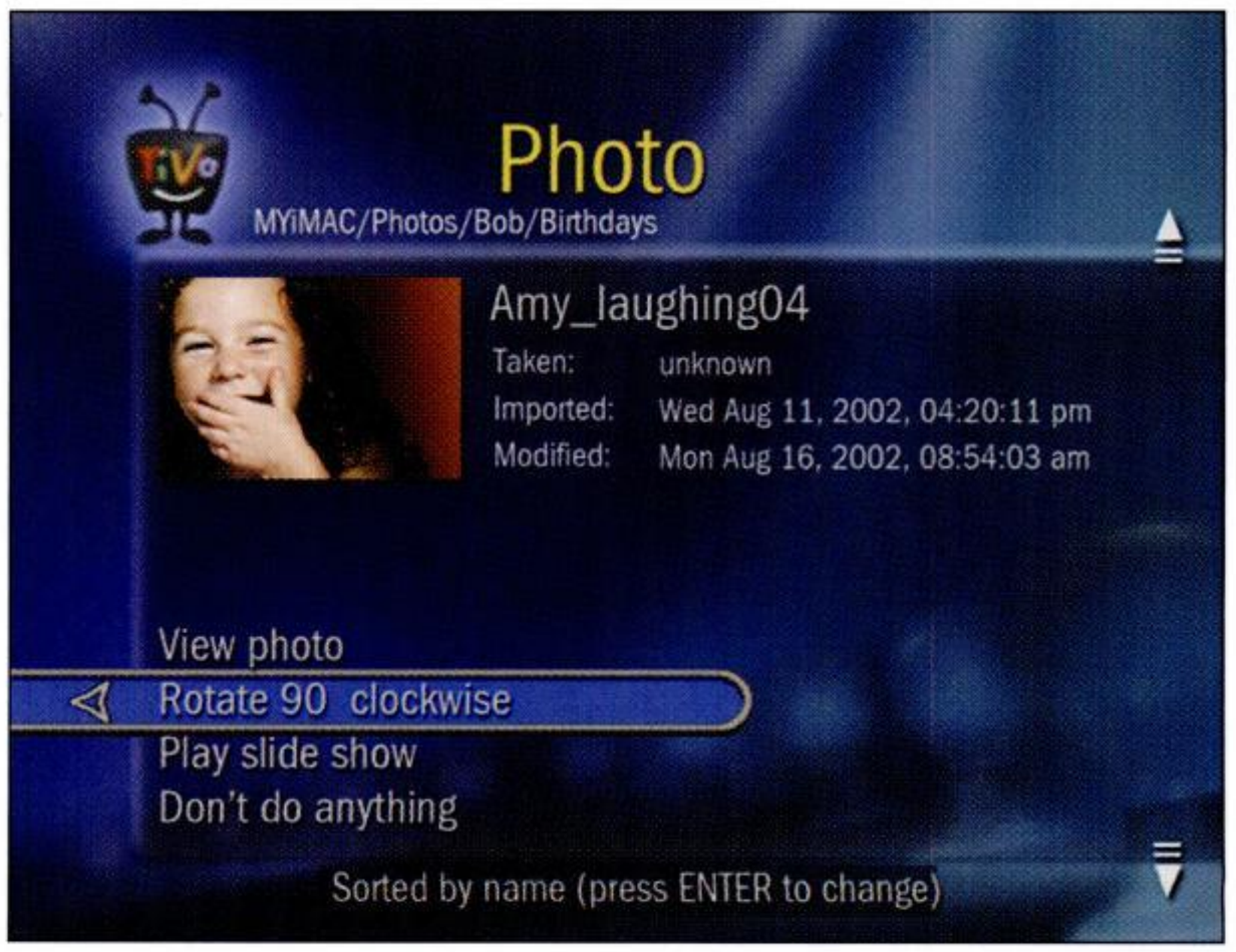
If you have a newer-model Series2 TiVo, you can easily integrate it into your home network and use it to view photographs and listen to music stored on PCs throughout your home network. And, provided you have Internet access, by hooking your TiVo into your network, you'll also be able to quickly schedule recordings from work or any Web browser around the world. Finally, if you have multiple Series2 TiVo digital video recorders (DVR), you'll even be able to transfer recorded TV shows and movies between the two!

Here's how to get it up and running.

Step 1: Prepare your TiVo for the Home Media upgrade

Assuming you have a Series2 TiVo, simply head on over to TiVo's account management page (**www.TiVo.com/manage**) and name your DVR. This

To enable your Tivo to play MP3s and display photos from your home network, download the Tivo Desktop app and "publish" the folders containing songs and images you want to share.



Now you can show off your pictures on your television, rather than forcing everyone to huddle around your PC.

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- **Complete** — You will receive the professional-quality diagnostic and repair tools and software you need to learn PC Repair at home. You can access study materials, take exams, check your grades, or even enroll, online. You're never alone; an instructor or student advisor is a mouse click or a toll-free phone call away, whenever you need help.

Spend an hour or so a day on your program, and in as little as nine months, you can get your Career Diploma and be ready to start your new job! You'll also receive preparation materials for the A+® Certification exam.

Earn your computer-related degree or diploma from a school accredited by the Accrediting Commission of the Distance Education and Training Council (DETC). Education Direct is also accredited by the Middle States Commission on Secondary Schools for our high school and vocational-technical programs.

* Source: U.S. Department of Labor *Occupational Outlook Handbook.*

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- ☐ 403 Internet Multimedia & Design**

☐ 408 PC Maintenance Technology**

- ☐ 37 Visual Basic® .NET Programmer
- ☐ 36 Visual C#® .NET Programmer
- ☐ 83 Web Page Designer
- ☐ 402 Web Programming**

Finance & Business
- ☐ 60 Business Management*
- ☐ 15 Home Inspector
- ☐ 08 Paralegal
- ☐ 70 Small Business Owner

High School
- ☐ 07 High School

* Associate in Specialized Business Degree Program
** Associate in Specialized Technology Degree Program

Name _____ Age _____
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City _____
State _____ Zip _____
Phone ( ) _____
E-mail _____

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will allow you to identify your TiVo on your home network, and will also allow you to schedule recordings on specific units in case you have multiple TiVos. (Don't laugh: lots of people do!)

Step 2: Connect your TiVo to your home Network USA

Series2 TiVo DVRs have two USB ports on them. To start, you'll need to connect your wired or wireless USB Ethernet adapter to one of these ports. USB Ethernet adapters are available at your local electronics computer store for under $40. Wired adapters are great because they're more reliable, but wireless adapters conveniently avoid cable clutter.

If you choose a wired adapter, once you're plugged in and your access point receives an IP address (assuming your network has DHCP, which it probably does), you're good to go.

If you choose a wireless adapter, you may get a pop-up message that says TiVo needs to update its firmware. Allow it to do so. Once this has occurred, press the TiVo button, then go into Messages & Setup, then Settings, then Phone & Network Setup. Then select "Edit phone or network settings," and then choose Wireless Settings. Here you'll proceed through a series of tasks that will connect your TiVo to your wireless LAN. It's very straightforward–you'll enter your network name or SSID as well as your WEP key (you do have encryption, don't you?). When you're done, your network will generate an IP address for your TiVo. If your network does not use DHCP, you'll have to assign your TiVo DVR a static IP number. (This applies to wired networks as well.)

Step 3: Prepare your home PC

The third step is easy. Browse to **www.TiVo.com/desktop** and download the TiVo Desktop application. This applet essentially establishes a mini-server that allows you to share (or "publish" in TiVo parlance) all the songs and photos in the folders you specify. You can set up the TiVo Desktop application on as many PCs in your home network as you'd like. Note that for now, TiVo works only with the MP3 file format.

Step 4: Play your music and view your photos from your TV

Now you're all set. It may take a few days or hours for TiVo to load in the modified version of the OS that permits you access to music and photo files on the network. On the main TiVo page, you'll see a new menu option: "Music and Photos". Choose this, and you'll be presented with a list of the PCs (or IP addresses) on your network that are publishing songs or photographs. Click into one of your systems, and you'll have access to the music and photos within.

Step 5: Schedule TV recordings via the Internet

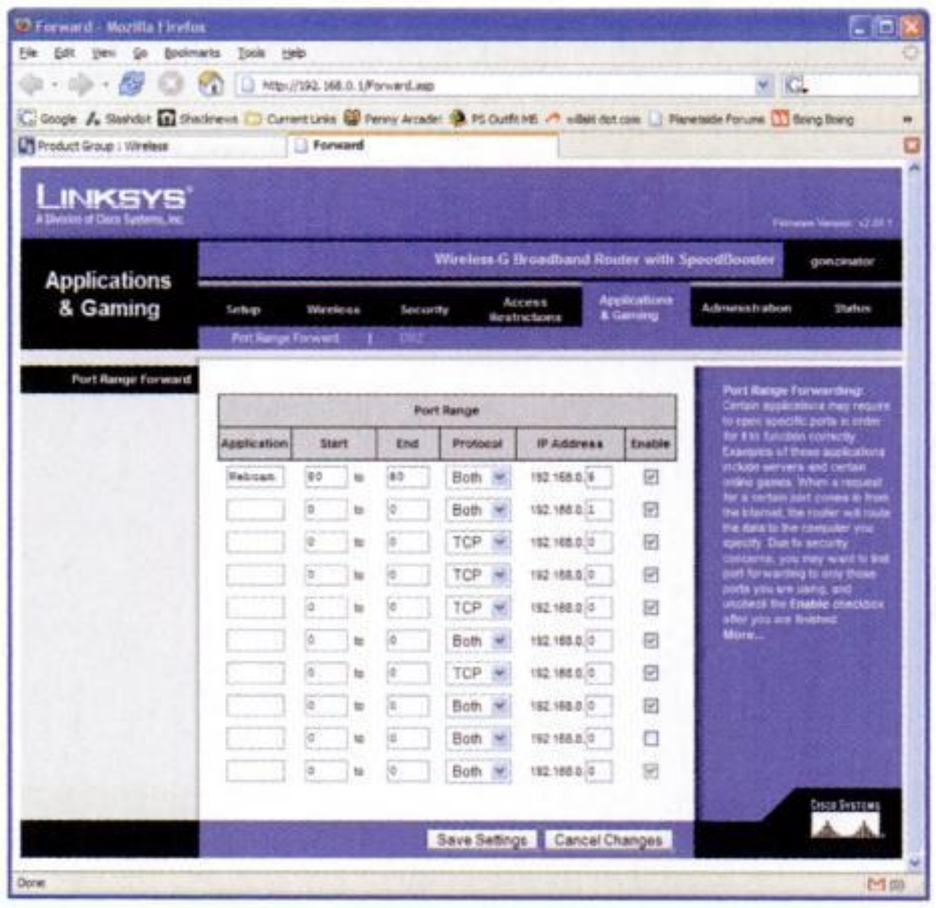
Forgot to record "Desperate Housewives?" You can also use your TiVo to easily schedule TV recordings from work or other remote addresses. Simply navigate to **www.TiVo.com/tco** and you'll be able to schedule any program you want, as long as it's 30 minutes from airing.

Set up a network of Wi-Fi webcams

If you've ever wondered what your pets do around the house when you're at work, it's easy to find out. There are a number of remote-controlled, standalone Wi-Fi webcams available now. It's reasonably easy to set them up, but there's a trick to configuring your router to allow you to connect to the camera from outside your home network. You may also have to run some additional software if you don't have a static IP address.

First, you need to pick up a camera. We like the DCS-5300 series from D-Link. They come in both 802.11b and 802.11g flavors, and the price difference is negligible, but they are a bit expensive at about $300. When you configure your camera, give it a static IP address in the same range as your PC's address. You can find your IP address by right clicking My Network Places, going to Properties, and right clicking on your Internet connection and clicking Status. Then click the Support tab. If your machine has an IP address of 192.168.0.102, then you'll want to give your camera an IP of 192.168.0.x, where x is usually a number between 5 and 99. Make sure you remember this number.

Once you've gotten your camera, you'll need to configure your router to forward certain requests from the outside world to your camera. In the router's configuration panel, look for something called "port forwarding." It's usually under game and application settings or something



Depending on what router you have, configuring it to access your webcam remotely can be tricky. Linksys routers are among the easiest to set up that we've tested.

Wondered what your pet does when you're at work? Find out with a wireless webcam.

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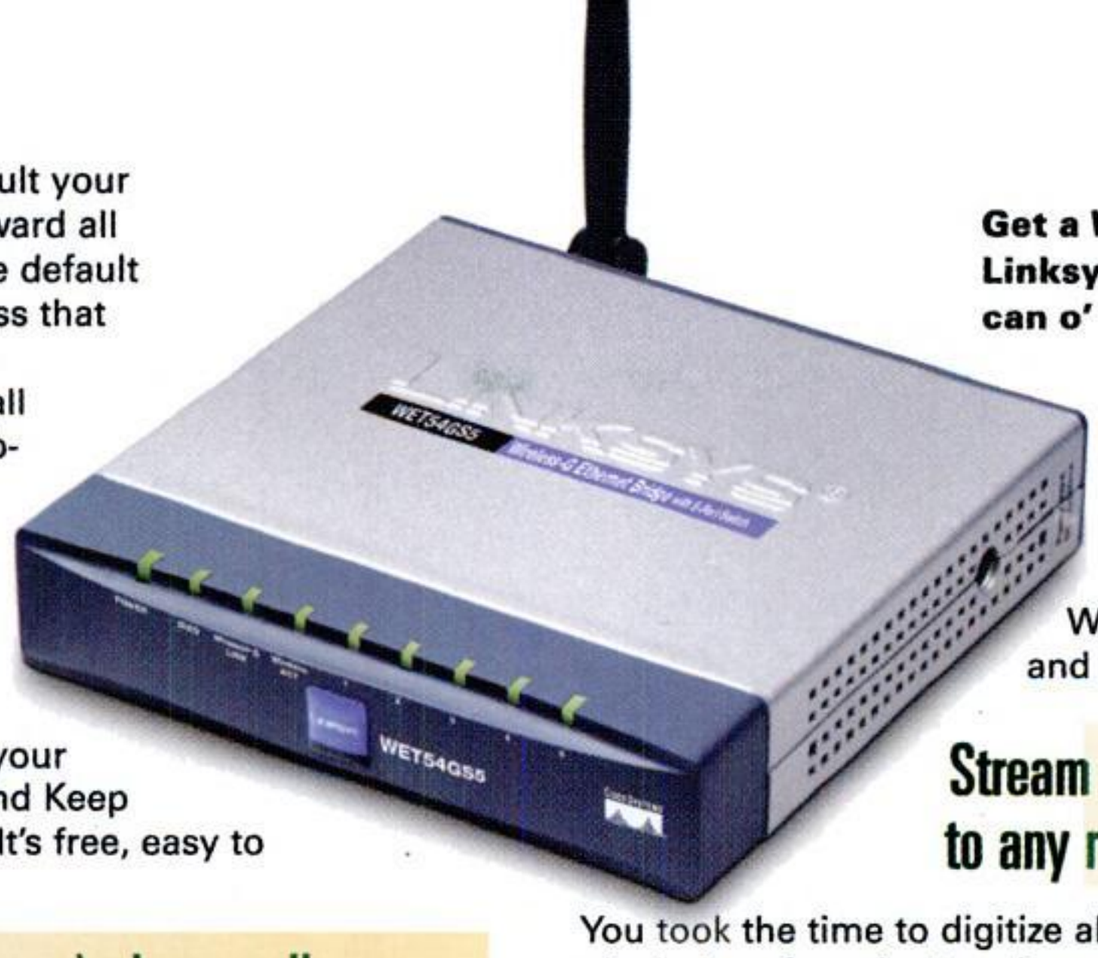
similar, but you may have to consult your documentation. You'll want to forward all incoming requests on port 80—the default port for Websites—to the IP address that you assigned to the webcam.

Now, to access your webcam, all you need to do is type in your public IP address—it's the one your ISP assigns—and you should be able to see the webcam. If your ISP gives you a dynamic IP address, you'll need to download and run another app that will let you know via email when your IP address changes. We recommend Keep Me Posted (**www.elegantlogic.com**). It's free, easy to use, and reliable.



Get a Wi-Fi bridge, such as the Linksys WET54G, and open up a can o' wireless tricks.

Make free (or really, really cheap) phone calls

There's a new kid on the telecom block, and it's called VoIP. VoIP stands for Voice over Internet Protocol, and it's got the phone companies running scared. Unlike earlier cockamamie schemes, the newest VoIP protocols work with normal phones and normal phone numbers. You buy a simple VoIP adapter, connect it to your Wi-Fi LAN, plug your phones into that, and you've got hyper-advanced phone features (voicemail delivered to email and uber-cheap long-distance—sometimes as low as $0.01/minute) at your fingertips.

There are loads of VoIP adapters on the market now, and it's really too early to declare a clear winner. We've done casual testing on most of the products you'll find at Best Buy and CompUSA, though, and you can't go wrong with them. However, the different adapters all sport different features, so make sure that the VoIP box you choose actually has the features you want.

You should also know that, for the time being at least, VoIP is a broadband-only technology. Don't expect to run a VoIP connection over a dialup connection or even poorly performing broadband.

Become your neighbor's ISP

So, you love having a super-high-speed DSL connection into your home, but you're tired of paying premium rates for your fat connection? Aren't we all. A new trend among ISPs is to allow you to share your connection with your neighbors via Wi-Fi for a reduction in cost of your service. We like it, especially since our neighbors sip bits, instead of guzzle.

Currently, Speakeasy (**www.speakeasy.net**) is the only ISP that we've heard of doing it, but you should check with your neighbors and ISP, too.

Connect your home theater (and game consoles!) to the Internet

Your living room has all sorts of nifty hardware that is screaming for an Internet connection. Your PS2, Xbox, and any kind of media-streaming box are literally begging to be connected to the Internet.

What you need is a device called a Wi-Fi bridge. They're available pretty much anywhere Wi-Fi devices are sold, and cost about $100. They allow you to connect wired Ethernet devices—like your PS2 or Xbox—to the wireless network. Once you've made a purchase, it's as easy as following the manufacturer's directions to configure the box, then plugging your devices into the bridge. It's worth noting that many Wi-Fi bridges also include built-in switches, which will let you connect more than one device to your wireless LAN.

We've tested both the Linksys WET54G and the D-Link DWL-G810 and found them wholly satisfactory.

Stream music—and video—to any room in your home

You took the time to digitize all of your CDs, and now you've got gigabytes of music stored on a hard drive somewhere in your house, but the only way you can listen to it on your home stereo is to either burn a CD or run a really long wire to your living room, right? Wrong!

With a streaming box, you can play your music and movies anywhere in the house that your Wi-Fi network will reach. All you need to do is run a small server program on an always-on PC and connect the streaming boxes to your wireless network. We have tested loads of music-only players, and we love the Squeezebox (**www.slimdevices.com**). We have also tested bunches of video- and music-streaming boxes, but haven't found one that combines good performance with an acceptable server app and a decent remote.

Get free Internet access almost anywhere!

One of the beautiful things about Wi-Fi is that it's everywhere, especially in major cities and heavily populated areas. We've not been to a downtown hotel in months where we actually had to pay for Internet access. We just sniffed around for unsecured Wi-Fi access points and started moving bits.

If you're going to mooch Wi-Fi from some unsuspecting techno-noob, you need to keep a few things in mind. First, since your transmissions are fully in the clear, anyone else who is connected to that access point can sniff all the data you're transmitting and receiving, so don't do anything sensitive—like log on to your online bank account—while you're connected to an unsecured AP. Second, make sure your machine is running a firewall. Third, make sure that your machine is patched with all the latest security updates before you go on the road. ■

Having wire-free access to your entire catalog of digital music is one of Wi-Fi's greatest applications, if you ask us.

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How To...

A step-by-step guide to tweaking your PC Experience

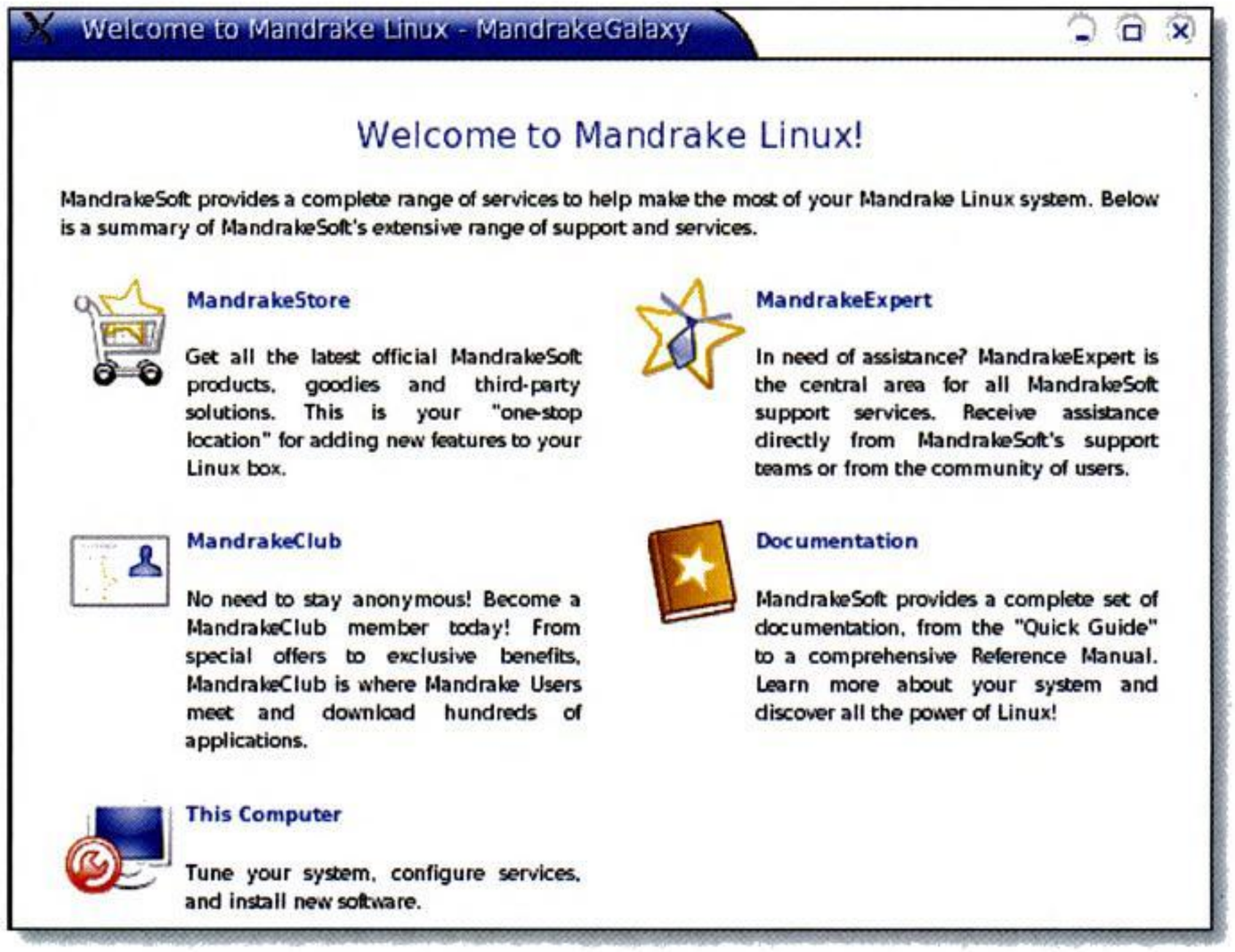
SAFELY INSTALL LINUX on Your PC

Installing Linux is easier than ever before. Our guide will help you avoid potential pitfalls

MAXIMUM PC
TIME TO COMPLETION
2:10
HOURS MINUTES

Whether you've been using Windows so long that you remember when it didn't even support 386 processors, or you just recently cut your teeth on XP, there are still benefits to be had from an alternative operating system. From casual users to hobbyists to IT professionals, more and more people are adding Linux to their Windows-based systems, or switching to Linux completely.

Linux has been a popular server OS for several years, but using it as your desktop OS used to require substantial technical savvy. This is slowly changing. Most versions of Linux, called "distros," are now freely available for download, and are much easier to install. Linux PCs can do everything that most Windows PCs do, from browsing the Internet and checking e-mail to playing games. There are even freely available *Office* and *Photoshop* clones.



Try Them for Free!

Want more information on the various Linux distros? Set your browser to **www.distrowatch.com** for news, reviews, and links to the latest distros and Linux apps.

Why would anyone want to fool with Linux? There are several perfectly valid reasons. Most Linux distros have more modest system requirements than comparable versions of Windows, so if you have an old PC lying around and want to set up a cheap web-browsing station, Linux makes a perfect choice. On the other hand, if you're a programmer and want to completely customize your OS, Linux source code can be modified to suit your specific needs. Lastly, while Linux isn't right for everyone, it's worth a power-user's while to gain some experience with it.

In addition to the downloadable versions of Linux, dozens of commercial distros are bundled with a multitude of utilities and full-blown programs at most computer and electronics superstores for less than $100. System requirements for most desktop versions of the OS are low—think Pentium II with 128MB of RAM—although some, such as Mandrake Linux, recommend 1GB of RAM and a 1GHz processor when used with a GUI such as *KDE* or *GNOME*.

We chose Mandrake for its easy install process, excellent hardware detection, and compatibility with both NTFS and FAT32 partitions. In this story, we'll cover the process of installing a downloadable version of Mandrake Linux 9.2 on a system running Windows XP.

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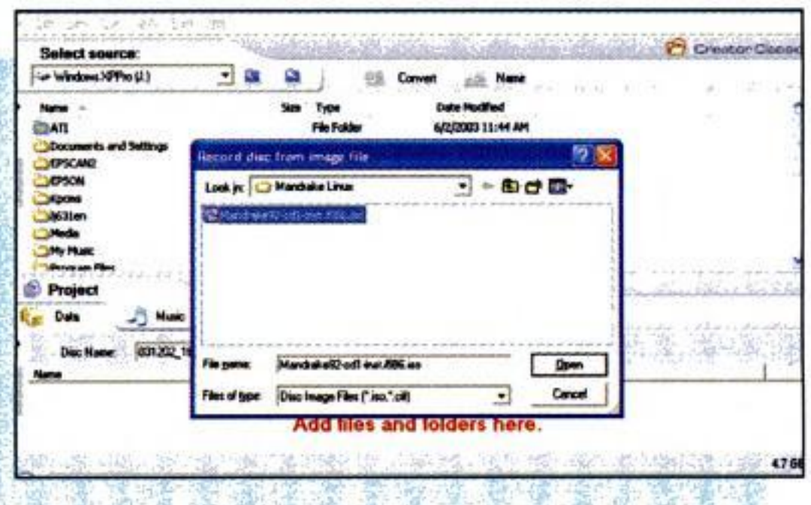
Linux Preparation

First, go to **www.mandrakesoft.com** and download the latest ISO version of Mandrake. ISO files are bit-by-bit copies of the data stored on a CD-ROM. There's usually more than one disc available for download, but you only need the first one for a basic install. There's no need to download a 600MB file full of source code if you don't intend to write any programs.

After you download the ISO image file used to store the distro, create an installation CD using a CD-mastering program that can burn ISO files to a CD-R. Both *Easy CD Creator* and *Nero* can burn ISO files. Most downloadable Linux distros are bootable ISOs.

Like any operating system, Linux must be installed on a primary hard disk partition. Most Windows systems have a single hard disk with one giant partition. Most recent Linux distros, including Mandrake Linux, can resize the existing FAT32 partitions to make room for an additional primary partition for booting Linux. If your drive is formatted using NTFS, you should get a third-party Windows app, like *Partition Magic* (**www.powerquest.com**), to resize your partition before you install Linux. (The Linux utility for NTFS resizing is flaky at best, and you don't want to lose your data.) If your main hard drive has less than 5GB of free space, you're probably better off installing Linux on a separate drive.



Back up your system with a product designed for disaster recovery, such as *Norton Ghost* (**www.norton.com**). If your Linux install goes poorly, you may need to reinstall both Windows and Linux to get going again!

Before you start the Linux install, make sure you run *Scandisk* and *Defrag* from inside Windows. You should also check your Linux distro's web site and make sure it supports all your hardware. Most distro vendors list tested and certified hardware with links for updated drivers on their site.

Sussing Out Your System's Mystery Hardware

To get the details about your system's internal hardware, use Microsoft System Information (MSinfo32) or a third-party program such as SiSoftware Sandra (**www.sisoftware.co.uk**). Make absolutely sure you write down the name of your videocard, chipset, mouse, soundcard, and network card!

Starting the Install

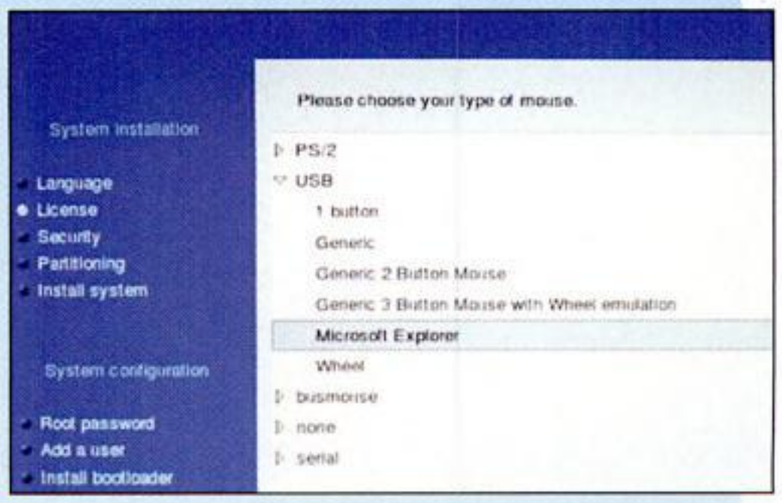
Insert the Mandrake Linux CD and reboot your machine to start the install process. If your system won't boot from the Linux CD, restart your system and enter the BIOS setup program to check your boot sequence. The boot sequence is often listed in the Advanced Setup or BIOS Features menu, or a submenu of one of these menus. Adjust the boot order so that the CD-ROM drive boots before the hard disk, then save the changes.

If your system still doesn't boot from CD, make a boot disk per the distro's instructions and start your system with it.

The Mandrake Linux installation program briefly displays a screen with a prompt to press Enter to start the installation. Advanced options can be changed by pressing F1.

Follow the prompts to select the region and language, and to accept the license agreement. Use the arrow keys and spacebar if your mouse is not recognized. The Mandrake installation program recognizes mice and pointing devices connected to PS/2, USB, serial, and even the long-obsolete bus mouse port automatically. Submenus enable you to select from a wide variety of serial mice and touch tablets. Make any necessary changes before continuing.

After loading drivers for your system, the Security Level menu appears. The default setting—Standard—is suitable for our purposes. Selecting a higher security level will make administering your first Linux box needlessly difficult, while setting a lower security level will leave your system vulnerable. After you've set the security level, enter your name and e-mail address as the security administrator, and click Next to continue.



Configuring Your Disks

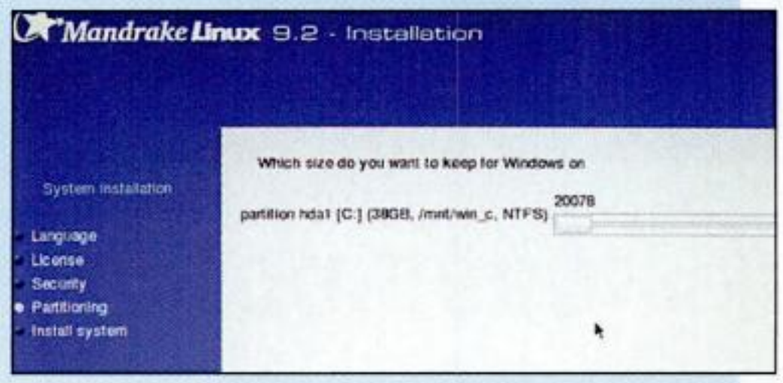
If Mandrake doesn't find empty space on your drive to install itself, it will open DrakX. DrakX is a partitioning wizard that analyzes the hard disk and allows you to resize existing partitions. It will present you with three options:

- Erase entire disk
- Use free space on Windows partition
- Custom disk partitioning

If you want to resize your FAT32 Windows partition, the best choice is to select "Use free space on Windows partition." Mucking about in the custom disk partitioning menus is not a good idea. It provides many additional choices, but could demolish your Windows partition. Not surprisingly, the "Erase entire disk" option wipes out Windows and anything else on your drive.

If you have more than one drive containing a Windows file system (NTFS, FAT16, or FAT32), select the drive you want to resize ("hda1" is the first hard disk on typical systems). If you haven't already, boot back to Windows and run *Scandisk* and *Defrag* before you continue.

Adjust the slider to change the amount of room to leave for Windows.



We'll select the minimum size for our Linux partition (19,611MB in this example), which will allocate about half of our system's 40GB drive for Mandrake. You can use less if you'd like: it's easy to steal more space from Windows later if you need it.

Click OK, and Mandrake will create your Linux partitions and format them.

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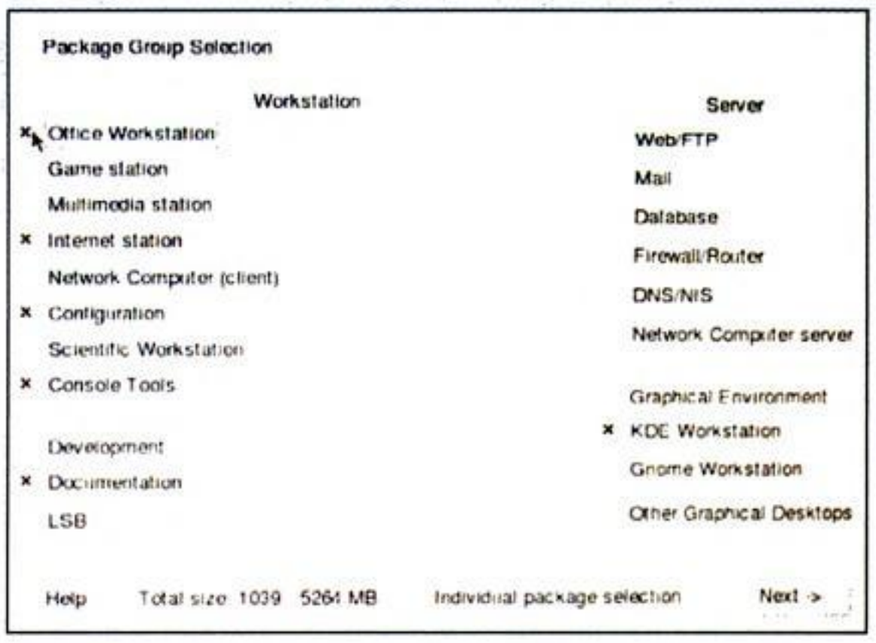
Selecting Packages

Next, the installer will prompt you to approve or select a software package. These packages are grouped according to task. You can safely use the default options, so click Next to continue. Because the one-CD download version doesn't include some of the listed items, there's little reason to make changes to this dialog. You can install software from the *KDE* or *GNOME* desktop later.

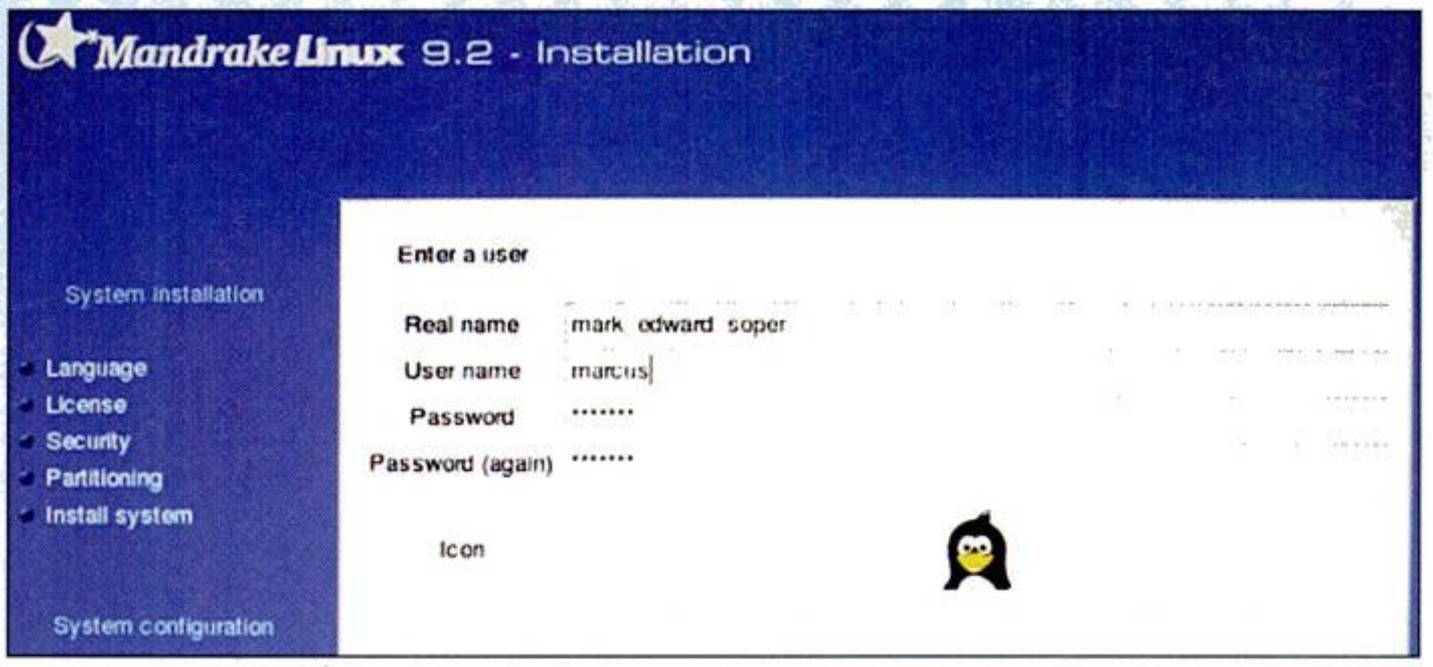
Linux displays a security warning if your software installation contains servers (such as the default webadmin server used for system configuration). Bypass that screen by pressing Next.

The Mandrake installer ejects the first CD after it's installed and prompts for additional CDs. If you are using a downloaded version, you probably have only one CD. You can safely click Cancel when prompted if you don't have the CD the installer requests.



Configuring Root, Users, and Login Options

Now you'll need to create a root password for your new install. The root account is similar to the Administrator of a Windows XP or Windows 2000 installation: The root user can completely control every aspect of system operation. Do not use the "No password" option. This will leave your system completely unprotected. Click Next to continue.



KDE and GNOME

By default, Mandrake Linux installs the K Desktop Environment as its default GUI. KDE closely mimics Windows' look and feel and offers easy configuration options through the KDE Control Center. Another popular GUI, GNOME, is less consistent than KDE and harder to configure. For a Windows user moving to Linux, we feel that KDE is the best choice.

Create an account for your day-to-day use. Do not use the root account for day-to-day operations. Not only is this a security risk, it's also very easy to break a Linux install when logged in as the root. Click the Icon button to choose a friendly badge for your account, then click Next to continue.

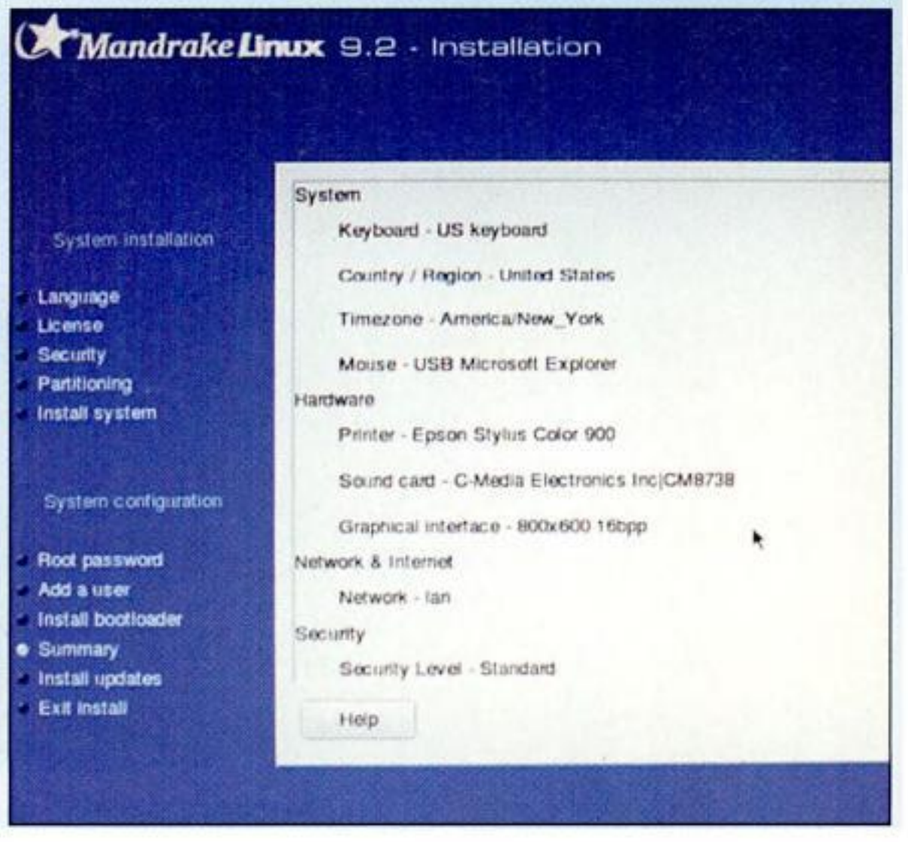
Mandrake will let you log on to your system automatically. Select the window manager you'd like to run; we like the default, *KDE*. Click Next to continue on to the summary and configuration dialog.

Selecting/Configuring Hardware

Mandrake will display a hardware and system summary dialog. The System category includes keyboard type, country/region setting, time zone, and mouse type. The Hardware category includes printer, soundcard, and monitor resolution and color depth. The Network and Internet category includes dial-up, broadband, and LAN connections.

Time zone selection is done by city, not by the traditional time zone name. Choose a city in the same time zone as your location. You can also choose to set your hardware clock to GMT and use a remote time server for a more accurate system clock.

Mandrake Linux can automatically detect many types of printers connected to parallel and USB ports. If your printer wasn't detected automatically or properly identified, click the Configure button next to the printer listing and then click "Add a new printer." Clear the checkbox next to "Autodetect printers," click Next, and select your printer port, brand, and model from the menus. After you select a printer, print a test page. Mandrake Linux uses *GhostScript* (a PostScript interpreter) to print to non-PostScript printers.



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Asus A8V Deluxe Motherboard
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See website for complete selections available

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w/Enermax EG265S-VE-FM SFX PS w/ Dual Fans
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AMD Athlon™ 64 processor 3000+
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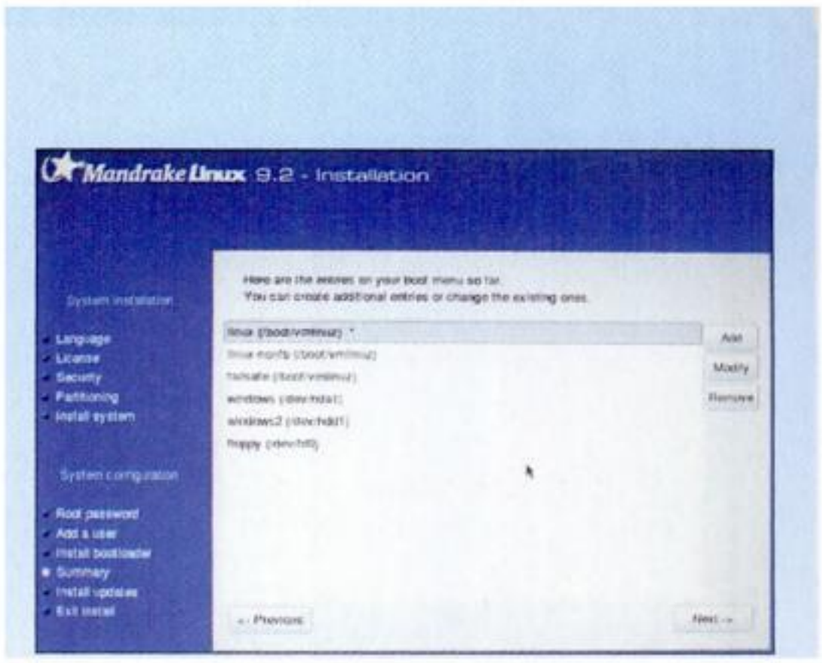
Configuring Your Bootloader

By default, Mandrake Linux uses the LILO (Linux Loader) bootloader. To view or adjust its configuration, click the Configure button on the bootloader listing on the Summary menu. You can select the boot drive, whether to run LILO in graphics or text mode, whether to use the Grub bootloader instead, choose a boot delay (in seconds), and enable or disable ACPI power management. Click Next to continue.

Mandrake Linux automatically detects bootable Windows versions on your system and adds them to the boot menu. In this menu, you can add, remove, or modify the entries. The operating system that will automatically start when the PC boots is marked with an asterisk. To select a different OS as the default, select your preferred OS, click Modify, and then check the box next to default.



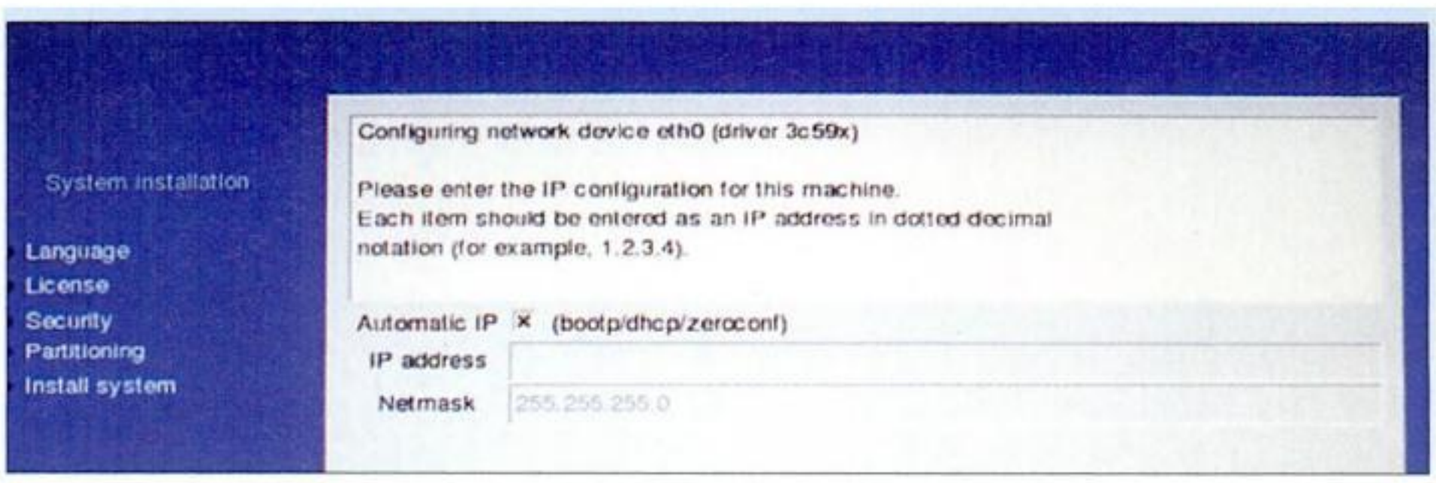
Configuring Network and Dial-up

To configure your Internet connection, click the Configure button next to the detected network type on the Summary menu. Mandrake will detect most network and modem hardware automatically, so your network card is probably already listed.

On the next screen, select your Internet connection type. If you have a standard modem, verify the serial port used by your modem. Enter the connection name, phone number, login name, password, and other information required. Note: External USB modems are generally poorly supported in Linux.

If your network uses a DHCP server to provide IP addresses (such as a router or a system running Internet Connection Sharing), you shouldn't have to change any settings.

After reviewing the detected and configured hardware, click Next from the Summary screen. Your configuration is complete. If your Internet connection is configured properly, you can now select Yes to download updated packages from the Mandrake web site before your first boot, which we definitely recommend. After any updates have been downloaded, you should remove the installation CD if it's still in the drive and click Reboot to get started.



Your First Linux Boot and Where to Go Next

The Mandrake First Time Wizard starts after the system boots. Inside the wizard, you can choose your default Desktop and pick a graphical theme. You can change any of these settings later, but it's easier inside the wizard. If you installed an e-mail client, you can also configure that from within the wizard. Click Forward to move through the rest of the wizard until the *KDE* desktop starts.

The *KDE* desktop provides a very Windows-like environment, although there are a few changes. Pressing Ctrl-Alt-Del will bring up a prompt to log off the current user. Press Ctrl-Esc to bring up the *KDE System Guard* monitoring utility. The K button in the lower left-hand corner of the screen will open the program menu, which is analogous to the Start Menu.

To install additional software, click Packaging and select "Browse or Install software." To mimic a typical Windows software installation, we install *KOffice* (*KDE's* office suite), *flphoto* (digital photo management and display), gimp (an image editor), *ksnapshot* (screen capture), *kaudiocreator* (CD ripper and audio encoder), *kscd* (CD player with CDDB database interface), *XMMS* (audio player using the *WinAmp* GUI), and various support utilities. Click Install and insert the Mandrake installation CD when prompted.

Now you've got a fully functional Linux install. You should be able to do anything you can do in Windows with your Mandrake install! If you're feeling intimidated—Linux is fairly complex—or get stuck, we recommend you check the sites listed in the sidebar on this page for some more tips. ■

Online Linux Resources

- **JustLinux offers help files, forums, and news for those who "wanna learn Linux." www.justlinux.com**
- **The Linux Documentation Project offers multilingual how-tos, guides, FAQs, and other resources for all parts of Linux. www.tldp.org**
- **The Linux Newbie Administrator Guide offers lots of hand-holding as you explore the guts of Linux. linux-newbie.sunsite.dk/**
- **You can learn more about your graphical desktop at the KDEHomepage (www.kde.org) or The GNOME Project (www.gnome.org/)**

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How To... A step-by-step guide to tweaking your PC Experience

GET THE MOST FROM Matrix RAID

Intel's new RAID controller lets you run two different arrays using just two drives

MAXIMUM PC
TIME TO COMPLETION
00:45
HOURS MINUTES

An all-new storage technology called Matrix RAID has emerged from Intel's skunkworks, and it offers a feature we've wanted for a long time—the ability to create RAID 0 and RAID 1 volumes on a single RAID array using just two hard drives. Matrix RAID is available on Intel's new 915 and 925 chipsets, which include the ICH6R south bridge. Imagine: You can take one pair of drives (also known as an array), and create a redundant mirrored volume for your OS and important documents, and a high-performance striped volume for apps, games, and any other applications where speed is more important than data security.

Although the technology is straightforward, the documentation that came with our ICH6R motherboard forced us to figure things out for ourselves. We'll walk you through configuring a basic Matrix RAID array, so that you won't have to muddle around like we did. We used a pair of Western Digital 74GB Raptors for our example, but Matrix RAID works with any pair of identical Serial ATA hard drives. Just adjust the size of your volumes to suit your needs.

Words to RAID by

RAID: *Redundant array of inexpensive disks*—a system that allows you to combine multiple drives in a single partition for either data redundancy, added performance, or a combination of the two.

ARRAY: An array is a group of hard drives. For RAID, a minimum of two hard drives is required for it to be considered an "array."

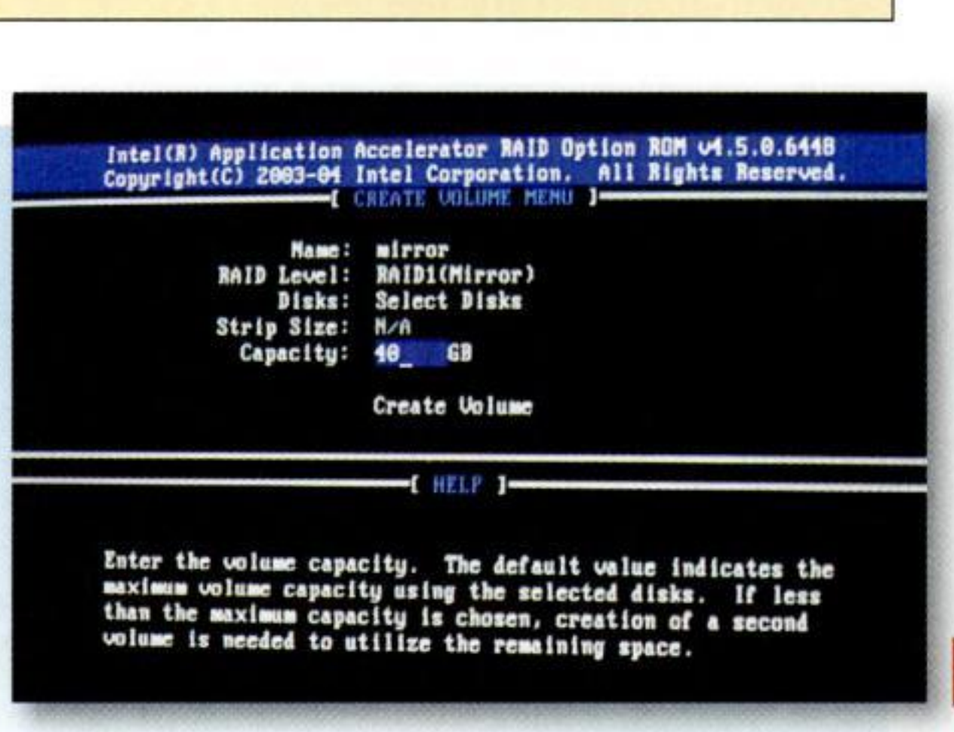
VOLUME: A disk volume is any portion of a drive or array that has its own drive letter.

STRIPING: Striping is the term for a RAID 0 array, where data is broken up into small chunks and written to both drives simultaneously, resulting in a pattern of data "stripes" across both drives. Striping data across two drives speeds up transfer times, but also doubles your chances of data loss due to drive failure.

MIRRORING: This technique is employed in a RAID 1 array, and involves all data being simultaneously written to two hard drives so the drives are in effect mirror images of each other. Mirroring greatly reduces your chance of data loss in the event of a drive failure.

1 Build a volume for reliability

The first thing we need to do is create a mirrored partition to hold Windows XP. Once the PC boots, press Ctrl+i to access the RAID configuration utility. Select RAID 1 and choose the drives to be used. You could choose RAID 0 at this point since you will also be creating a volume for that, but whichever array you configure first will be your primary drive. We allocated 40GB of space for our OS and apps—remember, this will consume 40GB of *each* drive. That means there is roughly 60GB left over in our test array, which we'll use for our striped volume.



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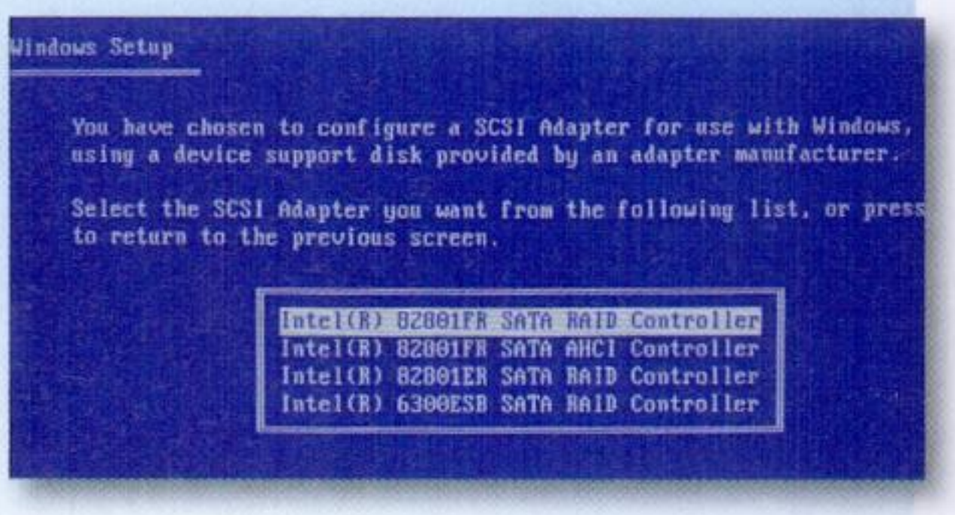
2 Build a volume for raw speed

Now that your mirrored volume is created, it's time to create a speedy striped volume. Select "Create RAID volume," and choose "RAID 0." You'll need to choose a stripe size—we generally recommend either 64KB or 128KB for optimal day-to-day use. Then simply select "Create Volume."

3 Install Windows

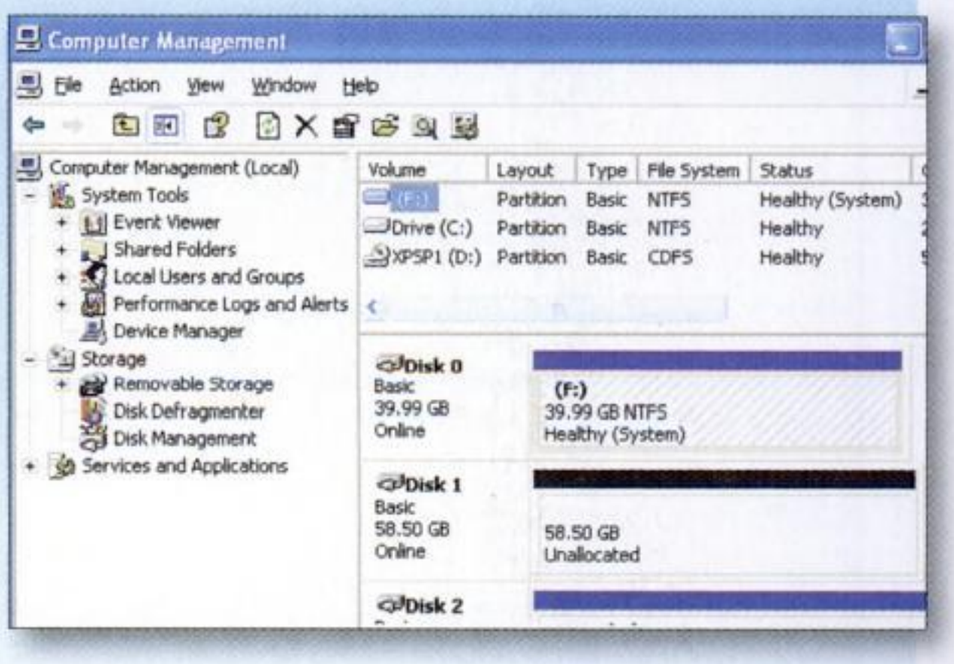
Installing Windows on a Matrix RAIDed volume is the same as installing an OS on any other RAID array. Boot off the Windows CD, then Press F6 when Windows prompts you to "Install a third party SCSI or RAID driver" and insert the floppy disc that came with your mobo when prompted.

When Windows asks which partition to install Windows to, make sure you choose the mirrored partition that you created first. Frequently, the only way to tell partitions apart is by noting their size (remember, our mirrored partition was 80GB total). After you choose the proper partition, the Windows install should proceed as normal.



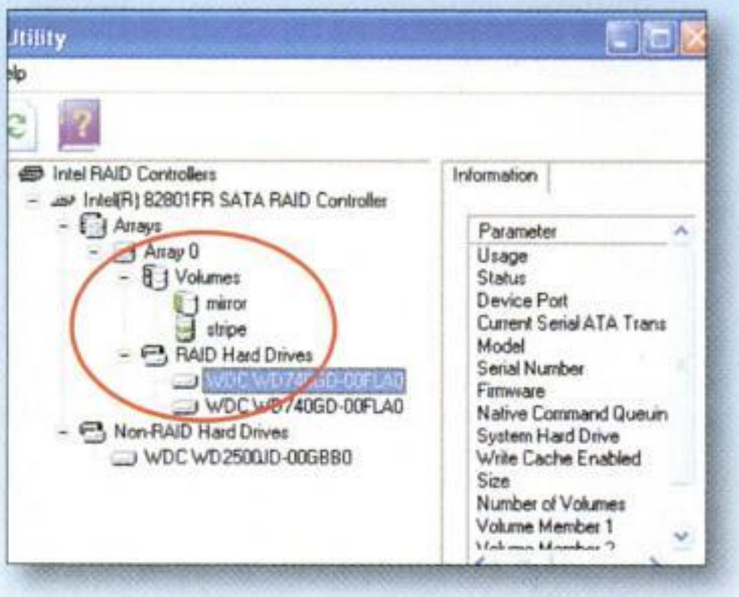
4 Managing the volumes

Once Windows is installed, you'll need to format your striped partition so you can begin using it. Open the Computer Management applet (Control Panel > Administrative Tools > Computer Management) and click Disk Management. You should see separate drives for each of the volumes in your RAID array. If you followed our directions, the drive labeled Drive 0 should be your mirrored volume, and the drive labeled Drive 1 should be your striped volume. Even though you already created the striped partition earlier, the space will show up in Windows as being unallocated. To correct this situation and activate the volume, right-click the unallocated space and select "Create Partition." Follow the instructions in the wizard, and once it's done, you should be able to access the striped volume just like any other hard drive.



5 Install Intel's RAID utility

Intel's Application Accelerator allows you to keep tabs on your array. As you can see in this screenshot, both the striped and mirrored arrays are fully functional. This utility allows you to monitor your arrays' status, and will warn you if it detects an impending failure or actual failure with one of the disks in the array. Installing the RAID utility is optional, but we recommend it. Remember that although the data on your mirrored volume is safe if one of your hard drives fails, all of the data on the striped volume is toast if one drive fails. If, while running the striped array the Intel RAID utility ever warns you your drives are going to fail, back up the data on the striped volume *immediately*! ■



WHAT ABOUT PERFORMANCE?

In order to determine whether running two distinct arrays across two drives diminishes either array's performance, we benchmarked each array using *HD Tach 2.61*. We're happy to report that performance for both arrays was comparable to what we've seen with single-array RAID configurations.

HD TACH 2.61	RAID 0	RAID 1
AV. SEQ. READ SPEED (MB/SEC)	109	65.35
BURST RATE (MB/SEC)	197	112
RANDOM ACCESS TIME (MS)	7.7	6.7

Notes: Results are for a two-drive array consisting of WD 740GD Raptors.

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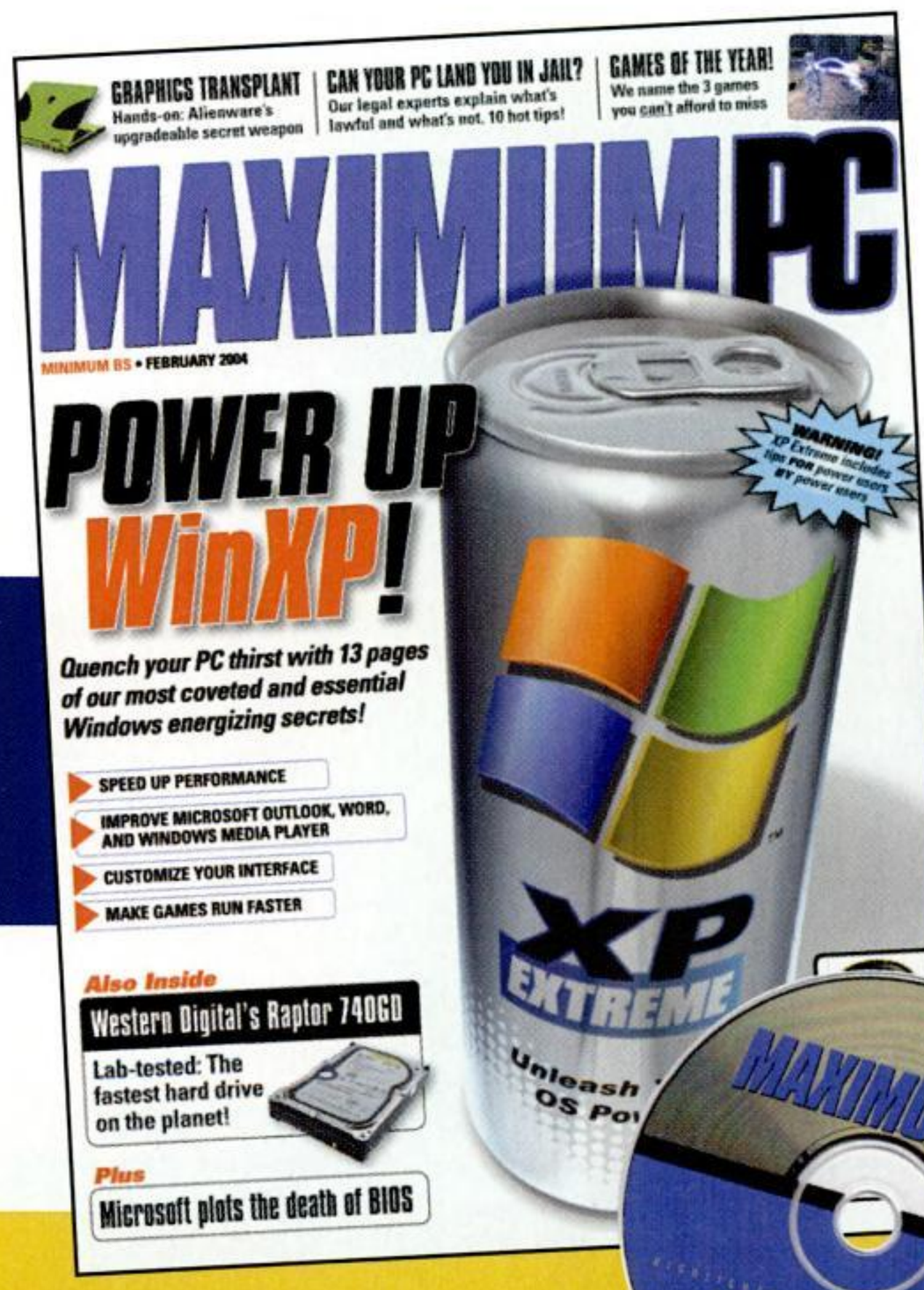

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How To... A step-by-step guide to tweaking your PC Experience

UPDATE YOUR Windows XP CD

Add RAID drivers and Service Pack 2 to your original Windows CD!

MAXIMUM PC
TIME TO COMPLETION
02:30
HOURS MINUTES

Think of how you treat a brand-new car: You cherish and pamper it at first. You even give up your Sunday afternoons to wash and wax it by hand. Your heart skips a beat whenever you see that gleaming steel beast waiting for you in the parking lot.

A newly installed version of Windows XP can inspire similar devotion. Not only do you thrill at its pristine condition, but you patiently, and even eagerly, download all the latest patches from Windows Update so as to keep your OS shipshape.

But over time, most of us begin to take that new car—or that clean WinXP installation—for granted. As it accumulates miles and wear-and-tear, your erstwhile pride and joy becomes just another drain on your wallet—and your time. Hand-washing, you discover, just isn't worth the effort anymore. In its place: a quickie car wash at the local gas station. If only there were a simple wash-and-rinse equivalent for WinXP.

Guess what? Such a thing does exist. It's called a Windows XP *reinstall*—and the quickest, easiest method for reinstalling is to create an up-to-the-minute Windows XP setup CD with the latest Service Pack and drivers preinstalled (aka "slipstreamed"), so you won't have to spend half your life on Microsoft's Windows Update web site. As always, *Maximum PC* is here to show you how it's done. Heck, we'll even help you add RAID or Serial ATA controller drivers to your CD so you won't need a floppy drive (or the F6 key) to install Windows.

Ingredients

- Windows XP CD
- Internet connection
- CD burner
- *ISO Buster* (www.isobuster.com)
- *Nero 5.5.9.0* or newer (www.nero.com)

1 Collect the Necessary Files

Before getting started, we'll need to download the full, standalone installation of Service Pack 2 (as opposed to performing a web-based upgrade). Go to download.microsoft.com and look under the Windows XP section.

While you're at it, grab the latest drivers for your RAID or Serial ATA controller. If you add them to your install CD, you won't need to use an old-fashioned floppy drive to install Windows. For an add-in RAID or SATA card, look for the drivers on the web site of your controller chip's manufacturer. Some of the most popular controllers are made by Promise (www.promise.com), Intel (www.intel.com), Silicon Image (www.siliconimage.com), and HighPoint (www.highpoint-tech.com). If your controller is integrated onto your motherboard, hit up your mobo manufacturer's web site.

You can roll your RAID drivers into your XP install disc by slipstreaming.

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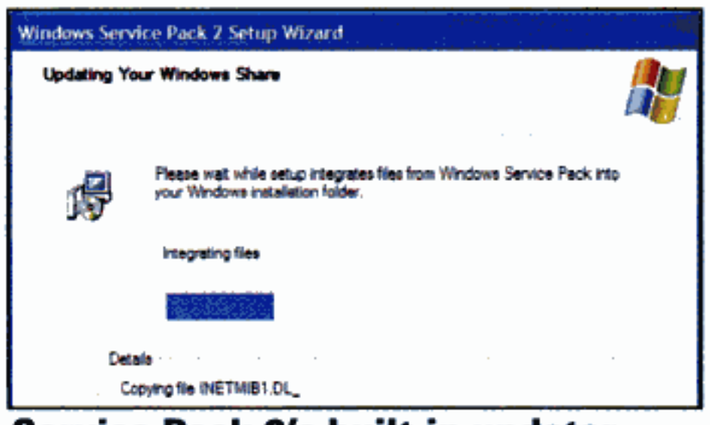
2 Update Your Setup Files

Our next objective is to extract Service Pack 2 to a folder so we can update our existing Windows setup files. Open the command prompt by clicking Start, Run, and typing `cmd.exe`. Use the change-directory command to navigate to the folder where you just saved the SP2 executable in the previous step. (The syntax for change-directory is `cd <path>`, so if you saved the SP2 executable to, say, `C:\Downloads`, you would type `cd C:\Downloads` to go there.) Extract the SP2 files by typing `xpSP2 -x`, where xpSP2 is the name of the SP2 executable you downloaded. When prompted for a destination to extract the files to, enter `C:\xpSP2`.

Once the files have been extracted, insert your Windows XP CD into an optical drive and copy its entire contents to a different folder on your hard drive. To keep it simple, use `C:\xpsetupcd` as the folder. Now, return to the command prompt and type the following command: `C:\xpSP2\i386\update\update /s:C:\xpsetupcd`. This will update your existing Windows setup files with the new code contained in Service Pack 2. A message box will pop up to notify you when the process is complete.

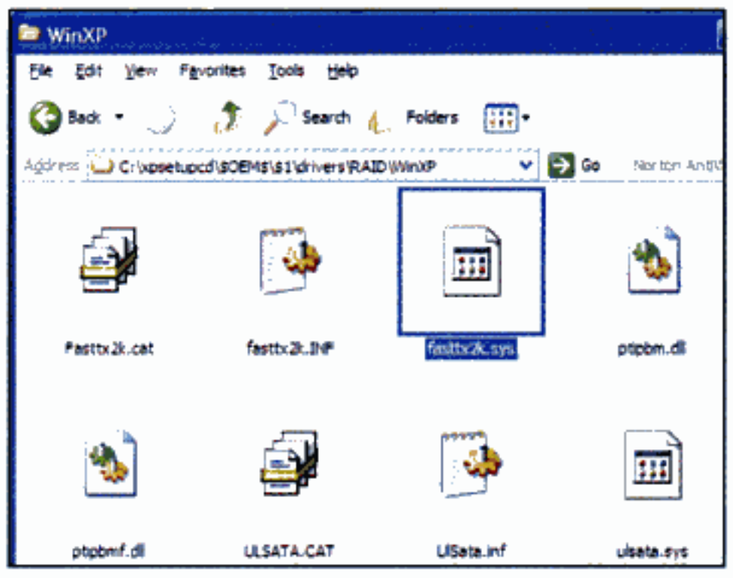


Service Pack 2's built-in updater makes it easy to patch your original Windows setup files with Microsoft's latest code.

3 Add Your RAID/SATA Drivers

We're now ready to add RAID/SATA controller drivers to our CD (if you don't want to do this, skip ahead to the final step). Open the folder to which you copied your Windows XP CD (`C:\xpsetupcd`) and create a subfolder called `$OEM$`. Then, create a subfolder of `$OEM$` called `$1` and a subfolder of `$1` called `drivers`. The resulting path should be `C:\xpsetupcd\$OEM$\$1\drivers`. This is where Windows Setup will look for drivers that aren't contained in its standard driver library. For organizational purposes, make a subfolder within `drivers` named for the type of driver it will contain—for instance, create a `RAID` folder for RAID drivers or an `SATA` folder for Serial ATA drivers. You can use any name, as long as it has fewer than eight characters.

With the aforementioned folder structure in place, copy the Windows XP RAID/SATA drivers directly into the folder you created above (we used `C:\xpsetupcd\$OEM$\$1\drivers\RAID`). If your drivers came in a self-extracting executable rather than a zip file, you may be able to extract its contents manually by opening it in a program like *WinRAR* (available at www.rarsoft.com). (Alternately, you can run the self-extracting executable, then dig around in your system's TEMP directory—usually C:/Documents and Settings/YourUsername/LocalSettings/Temp—until you find the right directory). Finally, locate the SYS file for your RAID/SATA controller from among the files you just extracted; it should be named after your specific controller (e.g., `fasttx2k.sys` for a Promise FastTrak TX2 RAID controller). The drivers for different operating systems may be split into distinct folders, so make sure you find the SYS file that's intended for Windows XP. Once you find the SYS file, copy it to the `i386` folder of your Windows CD (`C:\xpsetupcd\i386`).

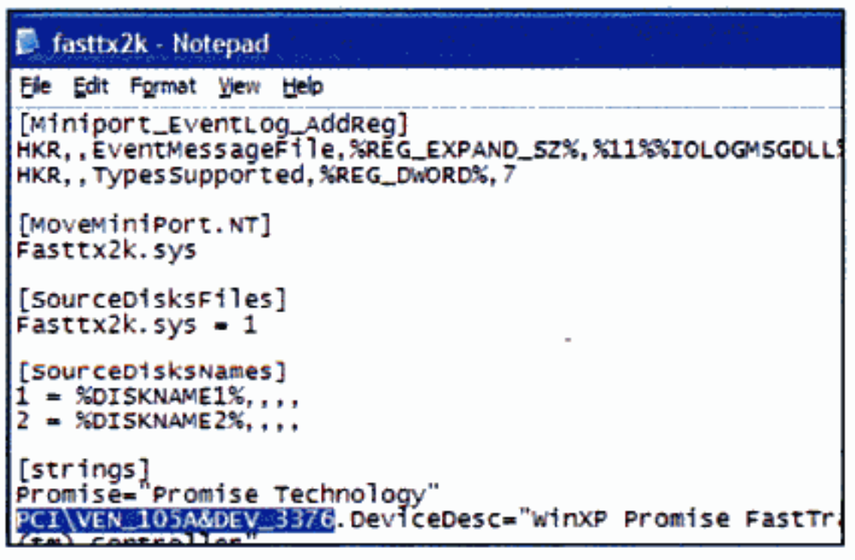


Adding RAID or Serial ATA drivers to your Windows CD will save you the trouble of using a floppy disk to manually install them every time you reformat.

4 Introduce Windows to Your Drivers

Now that we've added our RAID/SATA driver files to the mix, we need to tell Windows Setup about the existence of these drivers and how to use them. But unless you happen to have this information memorized—and if you do, this might be a good time to turn off your computer and spend some time in the real world—you'll need to look it up in your driver's INF file. This file is usually found in the same place as the SYS file you located in the previous step and will probably have the same name, albeit with an INF extension. Open the INF file in **Notepad** and copy the PCI identifier string, which is a series of characters beginning with "`PCI\VEN`"—for instance, `PCI\VEN_105A&DEV_3376`. There may be other text on the same line as the identifier string; if this is the case, start at the first occurrence of `PCI\VEN` and copy the text up to but not including the first period (or the end of the line, whichever comes first).

Next, open `TXTSETUP.SIF` (situated in `C:\xpsetupcd\i386`) and paste your PCI identifier string under the [HardwareIds Database] section of that file. At the end of the string, add an equal-sign followed by the driver name in quotes. In the case of our Promise RAID controller, the resulting line is: `PCI\VEN_105A&DEV_3376 = "fasttx2k"`.



Somewhere in the depths of your RAID/SATA controller's INF file lurks the fabled PCI identifier string.

Note: If your driver's INF file contains multiple PCI identifier strings, copy all of them into `TXTSETUP.SIF`. Now scroll down to the [SourceDisksFiles]

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section of `TXTSETUP.SIF` and add the following text: `driver_filename.sys = 1,,,,,,_x,4,1` where driver_filename.sys is the name of your RAID/SATA driver's SYS file. Note that you should include the .sys here. Then, under the [SCSI.Load] section, enter: `driver_filename = driver_filename.sys,4`. Once again, driver_filename is the name of your driver's SYS file. Note the lack of a .sys suffix on the left side of the equal-sign.

Finally, in the [SCSI] section of the file, add the following: `driver_filename = "RAID/SATA Device Name"`

You can enter whatever you want for "RAID/SATA Device Name," but we recommend using a meaningful description (such as the name of your RAID/SATA controller). Finally, save and close `TXTSETUP.SIF`.

5 Create a Customized Setup Routine

You're almost there. In this step, we'll make a file called `WINNT.SIF` in the `i386` folder of our Windows setup files (`C:\xpsetupcd\i386`). This file can be used to create an unattended installation routine—a subject beyond the scope of this how-to—but we'll simply use it to point Windows to the drivers we've slipstreamed. Create `WINNT.SIF` and enter the following:

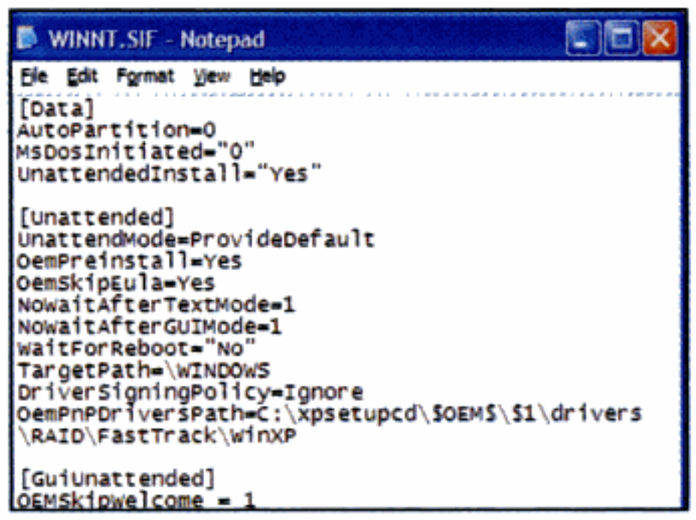
```
[Data]
AutoPartition=0
MsDosInitiated="0"
UnattendedInstall="Yes"

[Unattended]
UnattendMode=ProvideDefault
OemPreinstall=Yes
OemSkipEula=Yes
NoWaitAfterTextMode=1
NoWaitAfterGUIMode=1
WaitForReboot="No"
TargetPath=\WINDOWS
DriverSigningPolicy=Ignore
OemPnPDriversPath=

[GuiUnattended]
OEMSkipWelcome = 1

[UserData]
ProductKey=
FullName=""
OrgName=""
```

You'll need to customize the `OemPnPDriversPath` line by entering the path to the INF file for your RAID/SATA driver (for instance, if your drivers are in `C:\xpsetupcd\i386\$OEM$\$1\drivers\RAID`, use: `OemPnPDriversPath=drivers\RAID\FastTrack\WinXP`).



WINNT.SIF is a powerful file that allows you to customize and automate many parts of the Windows installation process.

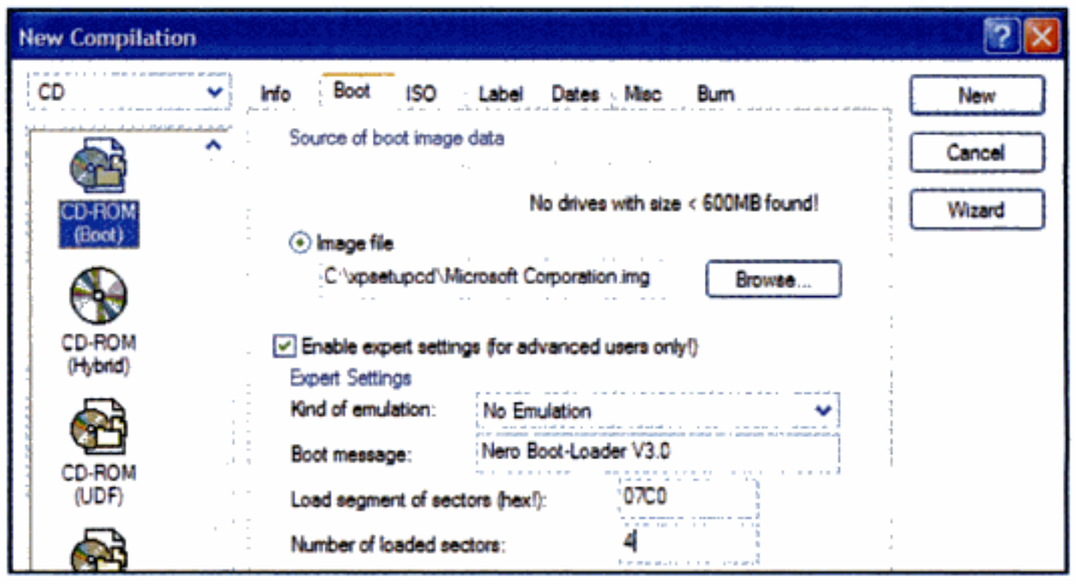
There are a few other fields you may want to customize before you close `WINNT.SIF`. Type your product key, name, and company name in the `ProductKey`, `FullName`, and `OrgName` fields, to avoid having to enter them during setup. And if you'd like to install Windows to a folder other than `C:WINDOWS`, edit the `TargetPath` field as needed.

6 Prepare Your Bootable CD

Our next task is to extract the boot image from our original Windows XP disc so we can use it to make our slipstreamed CD bootable as well. With your original XP CD inserted, launch *ISO Buster* and select "Bootable CD" from the left pane. In the right pane, right-click `Microsoft Corporation.img` and choose "Extract Microsoft Corporation.img." Extract this file to the folder where you copied your XP setup files (`C:\xpsetupcd`).

Fire up **Nero Burning ROM** (or **EZ CD Creator**, or any other CD burning app) and go to the New Compilation window (click "Close Wizard" if **Nero's** wizard comes up). Select "CD-ROM (Boot)" from the left pane and open the Boot tab. For "Source of boot image data," choose "Image file" and use the `Microsoft Corporation.img` file you just extracted. Check "Enable expert settings...," and set "Kind of emulation" to "No emulation" and "Number of loaded sectors" to 4. (These instructions will vary if you use another application, of course.)

Next, head over to the ISO tab and set "File/Directory name length" to "ISO Level 2." Ensure that "Format" is set to "Mode 1" and "Character Set" to "ISO 9660," and make certain all four checkboxes on this tab are checked ("Joliet," "Allow pathdepth of more than 8 directories," "Allow more than 255 characters in path," and "Do not add the ';1' ISO file version extension"). Finally, click the Label tab and set the "Volume Label" field to the value used by your original Windows XP CD—this is the name that appears next to your CD-ROM drive in My Computer when your XP CD is inserted.



Make your slipstreamed Windows CD bootable by extracting the boot image from your original Windows CD and feeding it to *Nero*.

At this point, we're almost ready to rock. Click the "New" button to open the Nero File Browser, and then locate the folder where you copied your Windows XP CD. Open the folder and add its entire contents to your CD image. When you're all set, mash the "Burn" button and bask in the glory of your shiny new slipstreamed Windows XP CD, complete with RAID/SATA drivers and Service Pack 2! ■

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How To... A step-by-step guide to tweaking your PC Experience

BUILD A Media Server PC

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HOURS MINUTES

A step-by-step guide to assembling a kick-ass PC that will stream music and video to any room in your home

We love having 20,000 songs and a couple hundred movies and TV shows at our fingertips at any given time. But storing that much data takes a dumptruck-load of drive space, and running multiple drives makes too much noise for a living room. The solution is simple: Instead of keeping a noisy, expensive PC in every room of your home, just build one monster server to hold all your movies and music, and stream the content to, smaller, quieter, quick-starting, network-connected dumb clients at every TV.

Of course, it's not this simple. A media server isn't something you can just pick up at Best Buy; you'll need to either build a new machine from scratch or adapt an older PC to your new needs.

So what kind of hardware makes the best server? What kind of network gear is required? What software and hardware tie it all together? Stick with us—we'll show you how it's done.

What you'll need:

- A computer with a TV tuner
- A reliable operating system
- A home network—wireless or wired
- The biggest hard drive (or drives) you can afford
- DVD archiving software
- Beyond TV (www.snapstream.com)
- An IR blaster to change cable box channels
- Music and video streaming devices

1 Collect the Ingredients

Your home media server doesn't need the latest processor or cutting-edge videocard. Pretty much any Pentium 4 or Athlon XP will do. You *will* need lots of memory, oodles of hard-drive space, an optical drive, and a cable or satellite line to the room housing your PC. You'll also need a soundcard of some sort, or a mobo that features onboard sound support, which is perfectly acceptable for our purposes.

Choose your case carefully—allow plenty of space for upgrades and cooling because the power will be on all the time. You may want to build your media server in a full tower case with lots of drive bays—after all, it'll take multiple hard drives to archive music, TV, and movies. We recommend a minimum of 250GB drive space—that's enough to store more than 200 hours of TV, about 30,000 songs, more than 50 DVDs, or any combination of the three.

The most important component in your media server is the TV tuner. You'll use it to record video from your cable or satellite TV signal. We recommend the ATI TV Wonder Pro ($50) or the Hauppauge WinTV-PVR 250 ($140). Both encode high-quality video and are affordably priced.

There are several options available for a media server OS. Cheapest, but the most difficult to configure, is Linux. If you pay close attention to the hardware you purchase—not all TV tuners and media streaming boxes have Linux drivers—you can build a top-notch Linux-based media server. For sheer simplicity of setup and ease of maintenance, we recommend using a Windows-based server instead. Windows XP Professional is sufficient for a low-traffic server with just a few simultaneous connections, but as you connect more TVs and add functionality, you should consider upgrading

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1 continued

your rig to Windows Small Business Server 2003. Small Business Server is more robust than Windows XP, and it includes a web, e-mail, and FTP server. Make sure your video capture card is compatible with Small Business Server 2003: many integrated AGP/Video-capture boards are not. We recommend against using Windows XP Home because it doesn't support advanced file-sharing.

To stream video and music from your server to the living room, you'll need some kind of streaming device. One option is to purchase a networkable DVD player, which will play normal DVDs, as well as stream music, MPEG-2 movies, and unencrypted whole DVDs across a network. There are also a variety of stand-alone boxes that stream standard media formats across a network. We're impressed with Hauppauge's MediaMVP (**www.hauppauge.com**) and Slim Devices' Squeezebox (**www.slimdevices.com**). Important note: The Squeezebox supports only audio files, not video.

Next, you need to get your software. For near-TiVo PVR functionality on the PC, we recommend *Beyond TV* (**www.snapstream.com**), which lets you record TV shows to a single computer, then stream them to any number of wireless PCs or other devices. Combine a *Beyond TV*-equipped server with a video streaming box, and you'll attain multi-room, networked PVR nirvana.

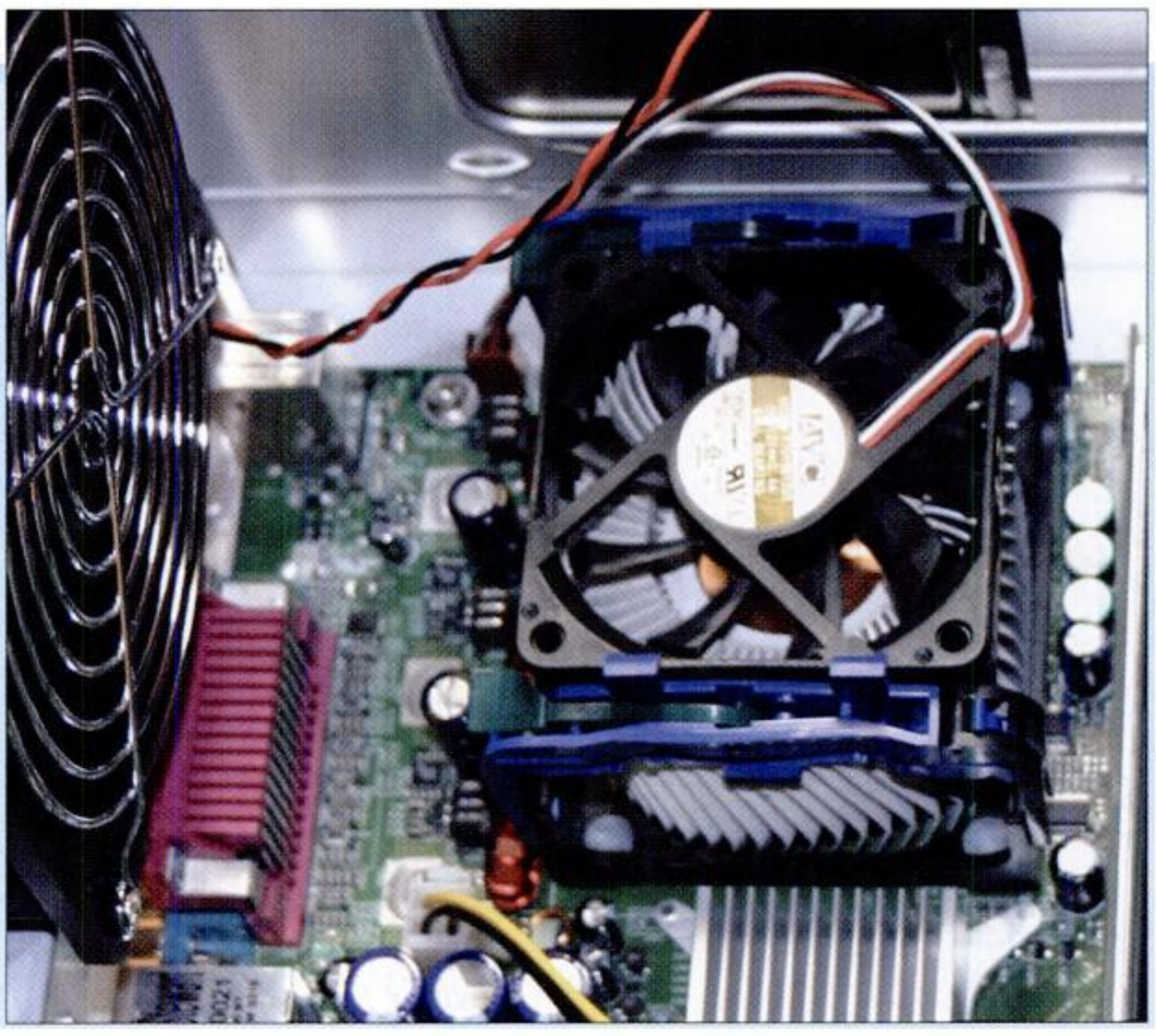
Finally, make sure you have a complete suite of DVD software: you'll need both a ripper and a DVD-authoring app. *DVD Shrink* (find it on Google) lets you archive your DVDs to folders on your hard drive, and recompresses them while it rips to conserve space. We recommend Sonic's *MyDVD* for authoring because it's easy to use yet still powerful in the hands of an expert.

2 Assemble Your Server

Building a media server is essentially like building any other machine. Remember, though, this system is going to run 24 hours a day, so adequate cooling is paramount. You should dedicate a couple of fans solely to the task of pulling in cool air over the hard drives as well as the other components. This will greatly increase your drives' lifespan, and help protect your precious data.

Once you've configured the hardware, you need to install the operating system. Installing Windows Server 2003 is almost exactly like installing Windows XP. Keep a few things in mind: First, for any server environment, it's a good idea to keep your applications and data on separate hard drive partitions. We recommend you create a small, 30GB partition for the operating system and application files. Leave the rest of your drive space unformatted for the time being—we'll take care of that later. Second, there's no reason to create a domain or enable Active Directory for your home network, so you can safely choose the Workgroup options for those two items during the networking portion of the install process. Third, we recommend against using your media server to share your Internet connection. Use a dedicated router instead; you can still give Internet users access to specific services on your server, but connecting an always-on server directly to the Internet makes it a big, fat target for worms, Trojans, and other Internet nasties.

When your machine is up and running, install your software applications—*Beyond TV*, your DVD ripping app, and your DVD authoring app. Don't start the *Beyond TV* configuration wizard yet; we'll set up the PVR software once we get all the drives configured.



Because your media server will be on 24/7, it's important to make sure your rig's cooling scheme is fully baked. Without proper cooling, your machine will melt down, and your media server will serve you no more.

Once your hardware is assembled, you need to install and configure your operating system. We used Windows XP Pro for our media server.

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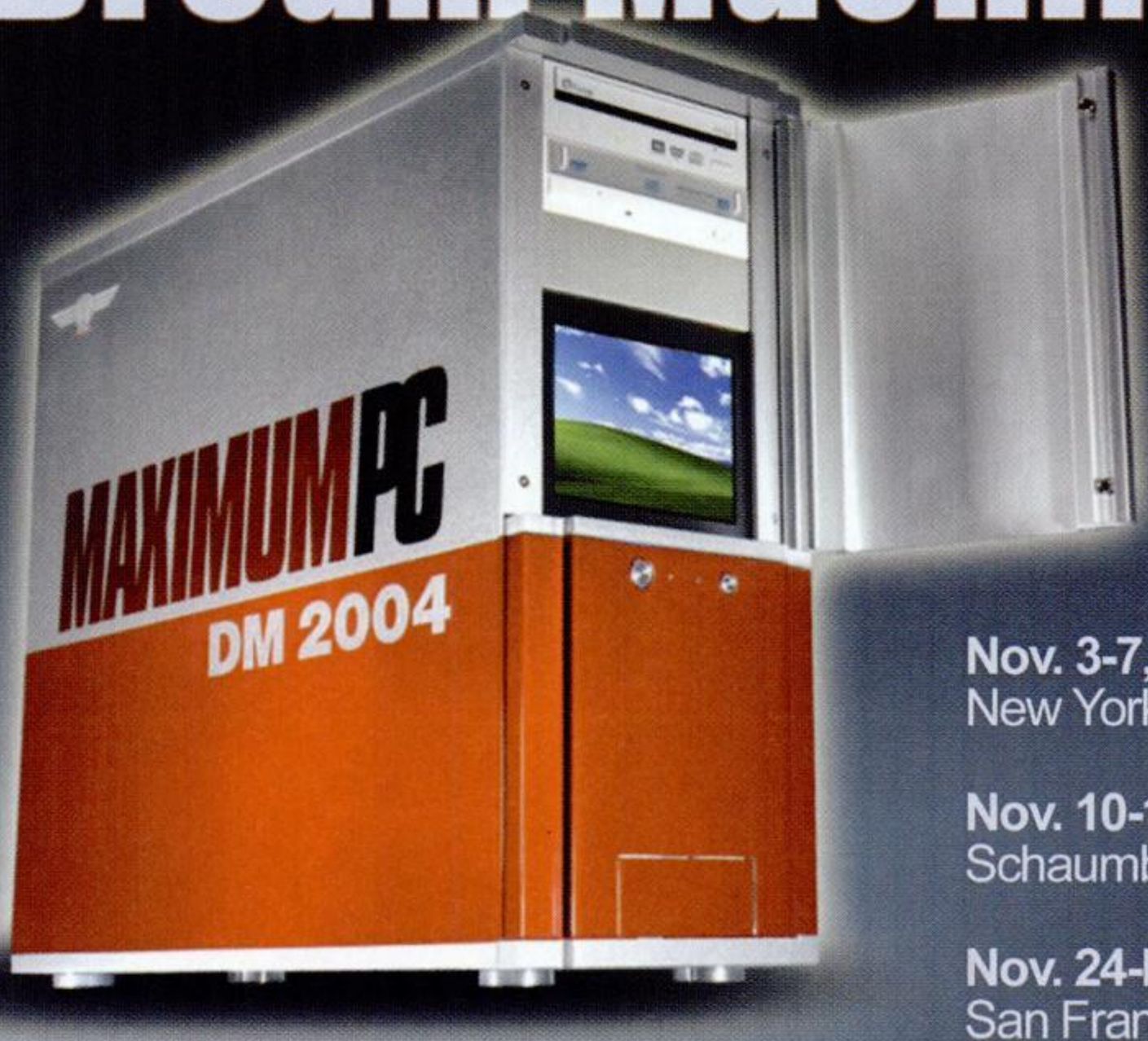

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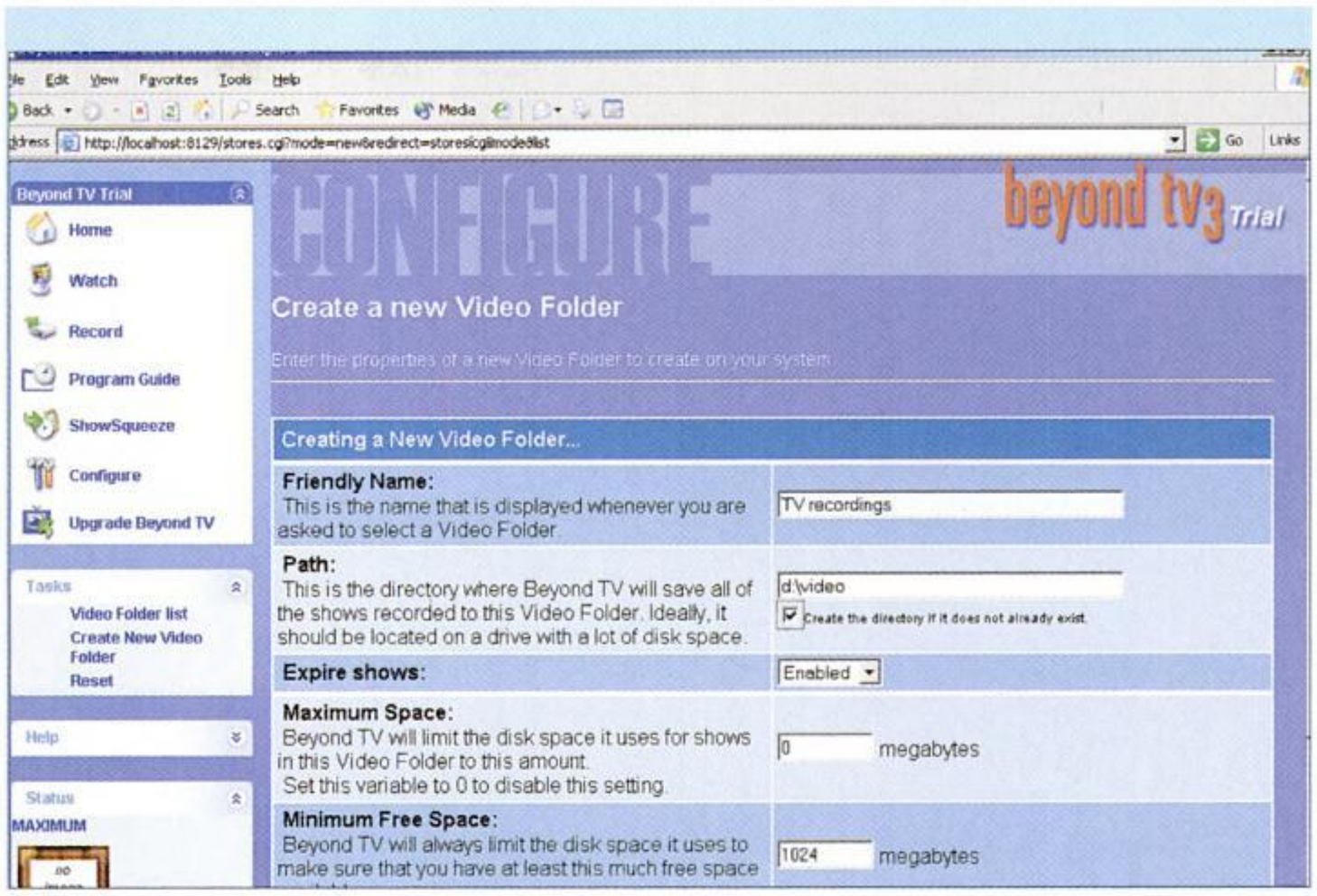
3 Create a Sensible Storage Scheme

Before you begin heedlessly ripping DVDs or recording TV shows, you need to develop a standardized scheme for storing your digital goodies. Some people recommend using a dedicated partition for each type of media—music, TV, and DVDs—but we find that a bit restrictive. We do recommend isolating your PVR files on one partition, though. Because PVR files are constantly being written and deleted, the drive that the PVR writes to will quickly become fragmented. Once you've created that partition, you'll want to use the remaining space for ripped DVDs and music.

Before you can create the partition, you need to decide how much drive space you want to dedicate to your PVR. Keep the following metric in mind: If you use DVD-quality MPEG-2, you'll eat a little less than 1GB of disk space for every hour of recorded video. We allocate at least 80GB for our PVR duties, but if you watch loads of TV, feel free to set aside even more.



Once you've created a dedicated partition for your PVR files, you need to open *Beyond TV* and point it to the new drive.

To create the PVR partition, go to Start, then Control Panel, then Administrative Tools. Click on Drive Management, and then right-click the empty space on the drive. Click Create Partition, then type the size you want your partition to be in megabytes—remember that 1GB equals 1,000MB. Once the partition is created, you'll need to format it. Use the NTFS format and the default cluster size. Name the volume "PVR." Make sure you open *Beyond TV's* control panel and tell it to save recorded video files to the new partition.

While you're inside the Drive Management utility, go ahead and create a third partition. This one will hold your ripped DVDs and music, and should fill up the rest of the drive. Format this drive using the NTFS file system and name it "Media." Once the partition is formatted, you'll want to create a couple of directories on it—one for ripped DVDs, and one for MP3s. Right-click the DVD directory, and select Sharing. Click the "Share this folder" button and press OK. Do the same for the MP3 directory.

NETWORKING CONFIGURATION TIPS

It's easier to find your media server if its IP address never changes. You can give it a static IP address, but you need to ensure that your router's DHCP server won't try to assign the same IP address to another computer. Consult your router's documentation to find out how to exclude an IP range from the DHCP service.

It's also easy to host a small personal web site, or set up a streaming server to access your tunes, TV, and movies from outside your home network. Via your router's firewall feature, specific types of requests that come to your IP address can be automatically forwarded to your media server's internal address. Check your manual for input on port forwarding.

4 Putting the "U" Into User

With your basic drive structure complete, it's time to create some user accounts and groups. Whether you use Windows XP Professional or Windows Server 2003, the components are in the same place for the most part. You can control exactly what level of access every user has to every directory, whether they're logged in to the computer directly, or merely connecting across the network. First, you'll need to create some user accounts, though.

Everyone who regularly logs in to your machine should have a user account. To create accounts, open the Computer Management applet again—remember, it's in Start, Control Panel, Administrative Tools—and select the Local Users and Groups tool. Open Users, and create some users. Simply right-click an empty area and select New User. Fill in a username and password and press Create. Rinse and repeat until you've created accounts for everyone who should have access to your server.

Now, this is the tricky part. If you have a lot of users, it's a real drag to go into each folder you make available on the network and manually change the permissions every time you add or remove a user. To avoid doing this, you can create groups, and assign the permissions you want to each group. Then you can place individual users in your groups. To set permissions for a new user, all you need to do is add

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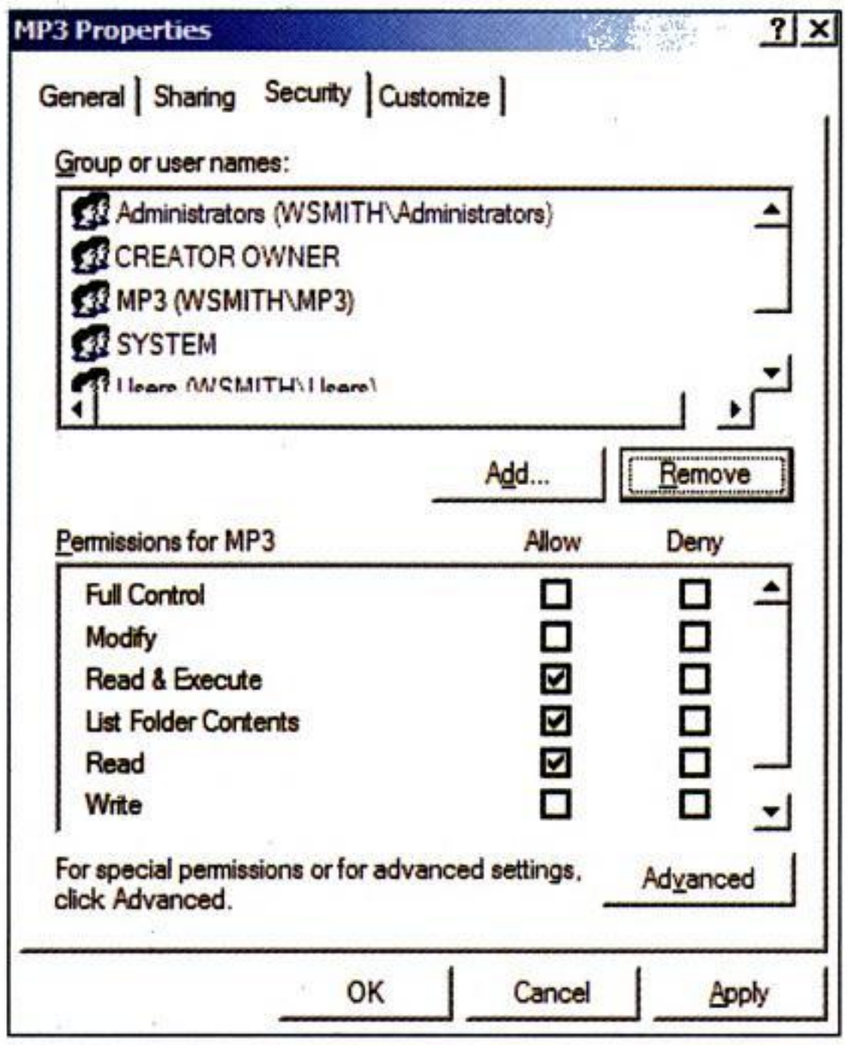
them to the appropriate groups. We recommend creating a group for MP3, DVD, and TV access. That way you'll be able to specify which media types each user has access to.

Of course, you still need to add your new groups to the Permission list for each of your directories. Give the MP3 group Read access to the MP3 directory, the DVD group Read access to the DVD directory, and the PVR group Read access to the PVR directory. Any user who is in one of those groups will be able to browse the appropriate directories from the network. If they're not in the network, they can't browse.



When creating user accounts, you can control the level of access each user has to any directory on your system by adjusting this Security tab.

5 Putting It Together

Now it's time to pull together everything we've done. Connect your cable or satellite receiver's video and audio outputs to the video and audio inputs of your TV tuner card. Then, connect your IR blaster—you can get one that works with most cable and satellite receivers from SnapStream's web site—to your PC. Start the *Beyond TV* configuration wizard, and answer each question. The only potential problem you might have is that you could select the wrong audio input during the install process. You'll know you selected the wrong input if your recorded video files have images, but no sound. To fix it, go into the *Beyond TV* control panel and try different audio inputs until *Beyond TV* successfully records video with sound.

Once the PVR software is installed and running, you need to connect your streaming devices to the network, install whatever software the streaming boxes need on the server, and configure it to display the appropriate directories.

Once you've connected your streaming devices to the server, you're ready to sit back and enjoy your new media server! ■

5 USES FOR YOUR NEW MEDIA SERVER

Stream music to yourself at work

You can install Slim Devices' Slimserver software on your server, even if you don't have a Squeezebox. Once installed, you can use it to stream tunes to any computer on the Internet. Just point Winamp, or another streaming client, to **http://your.IP.address.here:9000/stream.mp3**. You'll be able to set up playlists and change songs using your web browser. Go to **www.slimdevices.com** to get it.

Share photos

By creating a photo directory that's shared over the network, you can make all your digital photos accessible to every PC and streaming device in your house. Make a new directory on the same drive as your music and ripped DVDs, create a Photo user group, assign it the proper permissions, and add the appropriate people to the group. It's that simple!

Set up a personal web server

Now that you have a machine that runs uninterrupted 24/7, you really have no reason not to have a personal web server. Either use Microsoft's IIS server that's included with Windows XP Pro and Windows Server 2003, or download the free Apache web server (**www.apache.org**). Combine a basic web server with a dynamic DNS service—like the one provided by **DynDNS.org**—and you can even host a domain on your home page.

Create a private music-sharing network

With all your MP3 files in a central location connected to a high-speed, always-on Internet connection, your machine could form the backbone of a private peer-to-peer network. The new Waste client supports über-high shared-key encryption—up to 4,096 bits—and you can control who has access to the network. Get it at **http://waste.sourceforge.net.**

Stream live TV to yourself—anywhere!

If you properly configure the Beyond TV software, your system can transcode recorded and live video on the fly to just about any format. This means that, as long as you have an Internet connection, you need never miss your favorite shows. You can connect to *Beyond TV* and watch whatever you want, whether it's live TV or last night's Giants game.

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How To...

A step-by-step guide to tweaking your PC Experience

Remotely ACCESS YOUR PC

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Windows XP Professional includes a basic PC remote control tool, which lets you log into your PC remotely from anywhere. Do you know how to use it?

It's called Remote Desktop Connection, and when you've properly configured your PC, this handy utility will let you log into your computer from anywhere in the world and control it as if you were sitting in front of it instead of half a world away.

If you're running Windows XP Professional, you already have all the software you need to connect remotely to your PC. Whether you'd like to monitor a server, grab files from your home PC at work, or just keep an eye on your machines when you're out, connecting remotely is easy to do. However, due to the vagaries of network configurations and various other quirks beyond your control, you may not be able to actually connect. That's where we come in.

Prepping Your System

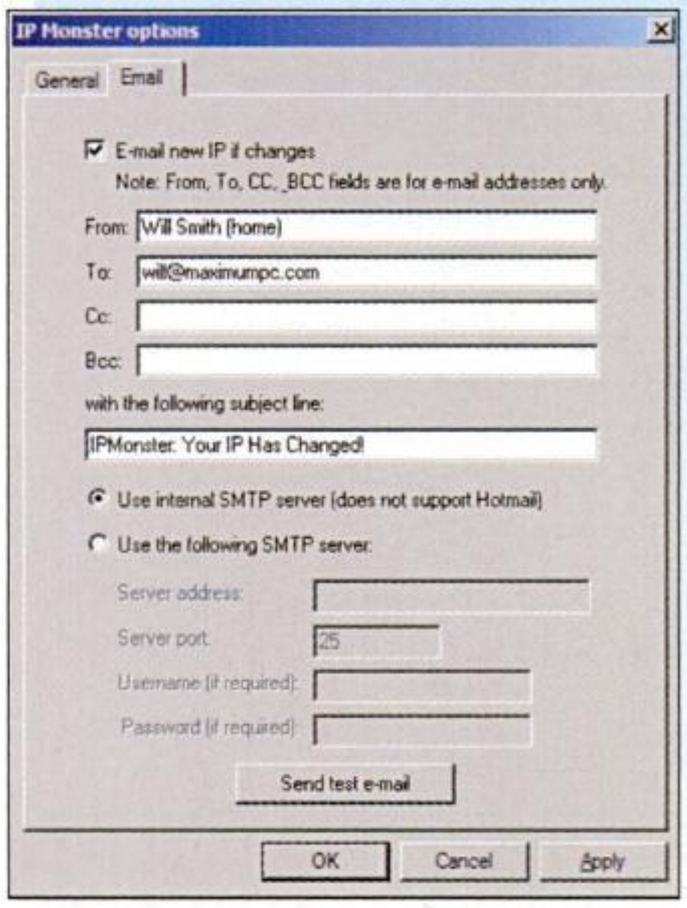
First, you need to know the IP address of the computer you want to connect to. The only sure-fire way to always be able to connect to your PC is to use an ISP that provides you with a static IP address. Most ISPs give customers dynamic IP addresses, which can change every few days or even hours. Because your IP address is the way you'll locate your computer on the net, you'll need to know what your IP address is and monitor it as it changes.

The good news is that there are loads of programs that will notify you of IP address changes, whenever they occur. We like *IP Address Monster* (www.ipmonster.com). It's a small program that runs in your system tray and can be configured to e-mail you whenever your IP address changes.

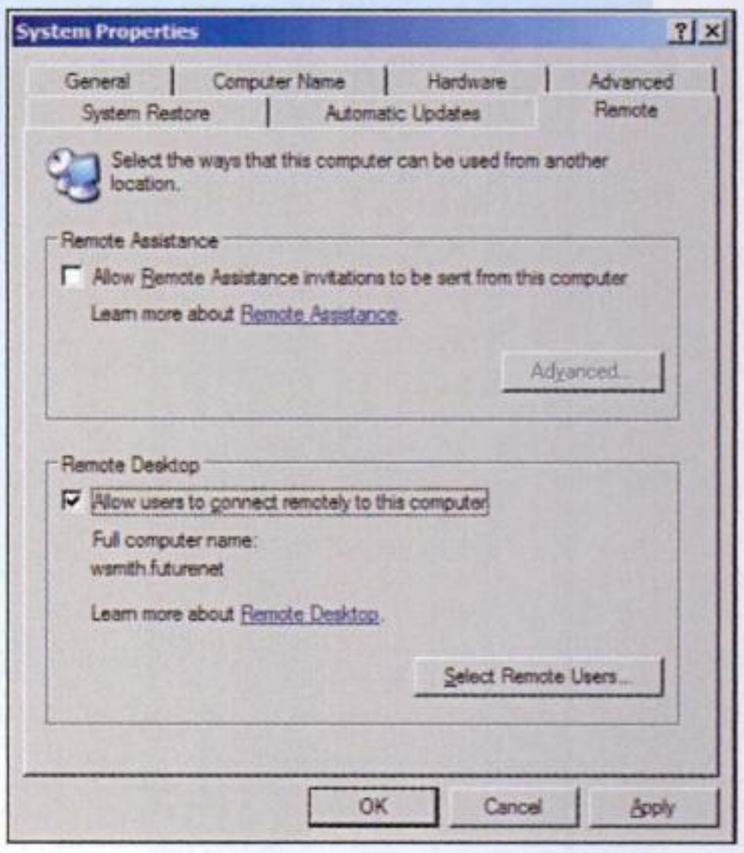
Now that you know your IP address, you need to make sure that Remote Desktop Connection is enabled. Make sure your firewall is configured to allow incoming connections on port 3389 (firewalls vary, so check your documentation to find out how to open the port).

You can turn on Remote Desktop Connection in the System Control Panel (Start, Control Panel, System). Check the Remote tab and make sure "Allow users to connect remotely to this computer" is checked. You'll also need to have at least one user account set up with a password because accounts without passwords are prohibited from logging into Remote Desktop.

It's important to have a "good" password on the machine you're going to remotely log into. This means you should use a mixture of letters and numbers and avoid words that are found in dictionaries. You should also change the password regularly to protect yourself from mischief.



***IP Address Monster* should be your first stop to remote connectivity. This handy utility will keep tabs on your Internet address and send you an e-mail whenever it changes.**



To enable Remote Desktop, open the System Control Panel, go to the Remote tab, and check this box.

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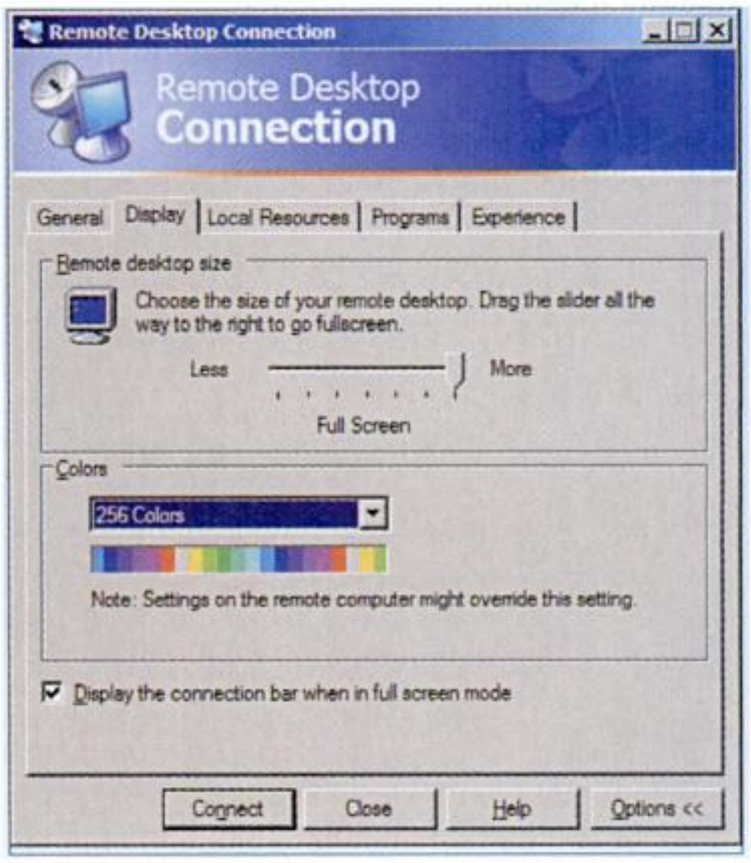
Making the Connection

At this point, your PC should be prepped and patiently awaiting for a connection. To log in, you need to open the Remote Desktop Connection client on your remote PC. Go to Start, Programs, Accessories, Communications, Remote Desktop Connection. Input the IP address you want to connect to (courtesy of *IP Address Monster*) in the Computer field. Then enter your username and password.

Now you'll want to tweak a few settings to optimize your remote experience. Whiz-bang features gobble up bandwidth, so you should tune your settings to match your home net connection. We recommend you start with a minimal feature set. Press the Options button, then the Display tab. Change the display settings to full-screen, 256-color. This looks acceptable and consumes practically no bandwidth. You'll also want to browse to the Experience tab and change the Performance setting to accurately reflect your home PC's connection speed.

Once you've tuned the connection a bit, you're ready to connect. Press the Connect key and you're in!



Switching to a lower color resolution and a smaller display area will greatly minimize the amount of data that has to transfer between your computer and the remote PC.

What to Do Next

At this point, you should be connected. You can run programs and manipulate files just like you're sitting in front of your PC. In fact, you can even use your PC's e-mail and web browsers. Do you want to start downloading *Desert Combat* now so you can start playing it when you get home? That's easy enough; just log into your PC using Remote Desktop, open your web browser, and download the file. It will be sitting on your machine waiting for you as soon as you get home. If all your PCs are running Windows XP Pro, and you enable drive-sharing in the Local Resources tab, you can transfer files from remote PC to local PC. You can even remotely transfer files between local PCs on your home network. ■

Once connected, you can interact with printer ports and networked hard drives. This is a handy way to delete those "special interest" videos you downloaded before your wife finds them.

HOW TO SHOP ONLINE, THE SAFE WAY

Buying online is easy and convenient, but it can be risky. Follow these guidelines to avoid a consumer disaster!

1. Visit **www.bbb.com** and search the Better Business Bureau's files for complaints about the online retailer you're considering. Then check **ResellerRatings.com**, a site where consumers rate online stores. A good record is generally enough to tell you that a store is reliable. Keep in mind that every store will have a few registered complaints, so don't let one or two negative comments spook you. In fact, stores with too many clean reviews raise our suspicions.

2. Read and print all of the store's policies. What's the return policy? What is the restocking policy? How long will the store warranty a product before you have to send it directly to the manufacturer? Is there a restocking fee for DOA equipment?

3. Keep detailed records. When you buy online or have conversations with customer service, write down whom you spoke to and when you spoke to them. And get a confirmation number from your contact! If the transactions are online, print out the confirmation information and keep it in a safe place.

4. Use a credit card with a good fraud protection policy. Do not wire payments, send cashier's checks, or send personal checks. A credit card will protect you if the deal goes sideways. PayPal won't.

5. If the deal does go bad, immediately call your credit card company and reverse the transaction. Make sure you submit a reversal request in writing before the credit card company's deadline expires. Unscrupulous stores will deliberately delay responding to your inquiries until the deadline has passed.

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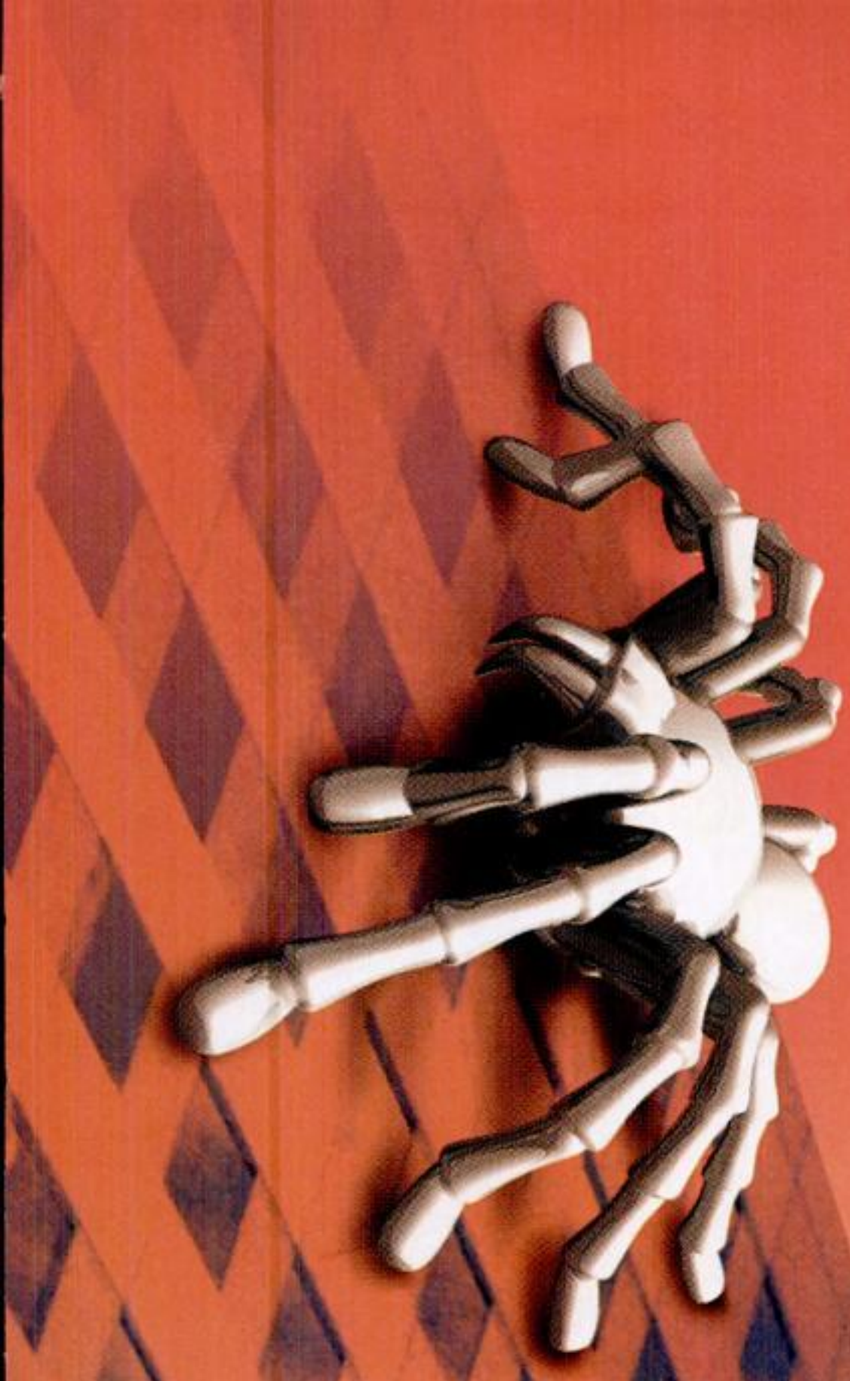

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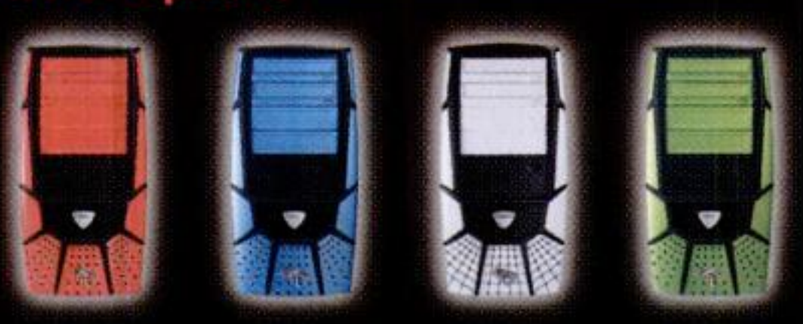

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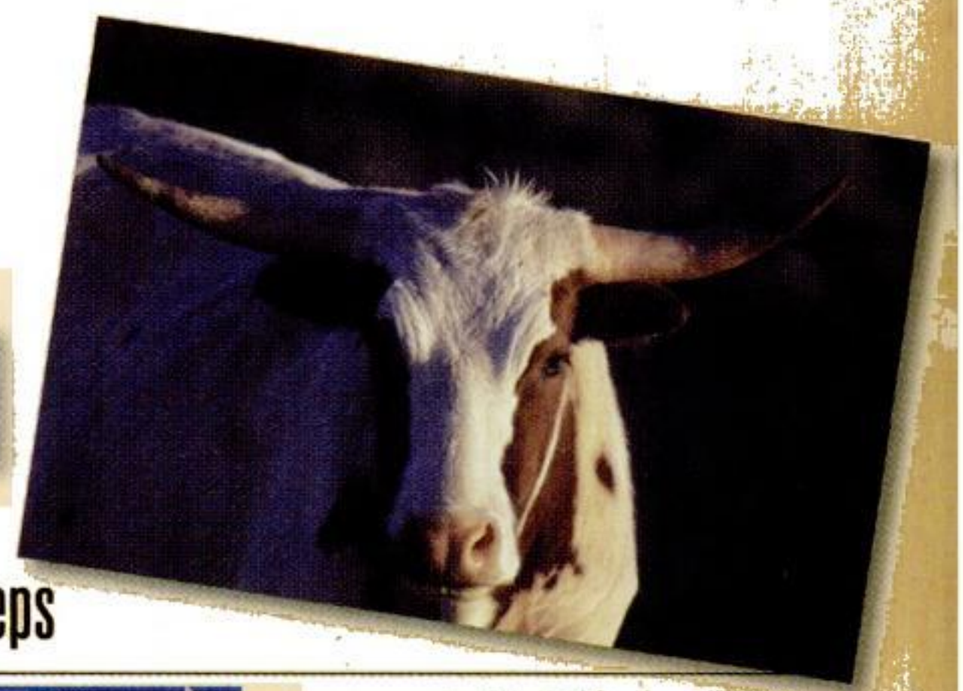

You don't have to wait until 2006. Give Windows XP a next-generation makeover today in four simple steps

SmartBarXP

SmartBarXP is a freeware utility that replicates the upcoming Windows Longhorn "sidebar." This is sort of like a vertical Taskbar, but the primary difference is that the Taskbar is used to display running applications whereas SmartBar can be used to display a wide range of data, such as system performance, news feeds, the time, and more. It works by hosting numerous "panes," each of which you can configure to display practically any information your heart desires. The best part is that the bar is 100 percent customizable, so you're not forced into displaying a clock or stock ticker, for example, if you don't want to. Plus, you can make it auto-hide, or set it to have a custom level of transparency (in the above screenshot, it's set to about 30 percent). **www.smartbarxp.com**

WindowBlinds with Longhorn Theme, New Bliss Wallpaper

If you want XP to look and feel like Longhorn (at least in its present implementation), install a Windows skinning utility such as *WindowBlinds*. Although we're generally wary of intrusive software like this (it re-skins your entire OS, including folders, menus, windows, and so on), we have experienced little trouble using *WindowBlinds'* Longhorn Slate 4051 skin, which is a dead ringer for the beta versions of Longhorn thus far. It literally transforms XP into an entirely new-looking OS, complete with Longhorn-like menus, windows, and more. The only thing missing is the 3D interface. The new skin, combined with this Longhorn beta version of the all-new "Bliss" wallpaper, makes it look exactly like you're running Longhorn. Fool your friends!
www.windowsblinds.net

Windows Media Player 10 with Compact Skin

The beta version of *Windows Media Player 10* (the final version should be available by the end of the year) was designed with Longhorn in mind, so it's not surprising that, when combined with the "Compact" skin, *Media Player 10* perfectly matches the Slate skin we've seen in the early versions of Longhorn. There's a good chance *WMP* will be completely revved by the time Longhorn comes out, but until then, this is as close to "next-gen" as you can get.
www.microsoft.com/wmp

dtSearch

Longhorn's upcoming Windows File System (WinFS) will reportedly allow contextual searches as well as the ability to scan your entire system in seconds thanks to its database structure. But here's a news flash: You can get this functionality now using *dtSearch*, a powerful filing system *Maximum PC* discovered as a way of quickly searching through all the content from our issue archives. Once *dtSearch* scans the files and directories you specify, it creates an index that allows it to retrieve files instantly. It not only pulls up file names, but also words within the individual files, and you can search using more than two dozen different search methods, including fuzzy searching (for animal pictures), Boolean queries, and more. Sounds familiar, right?
www.dtsearch.com

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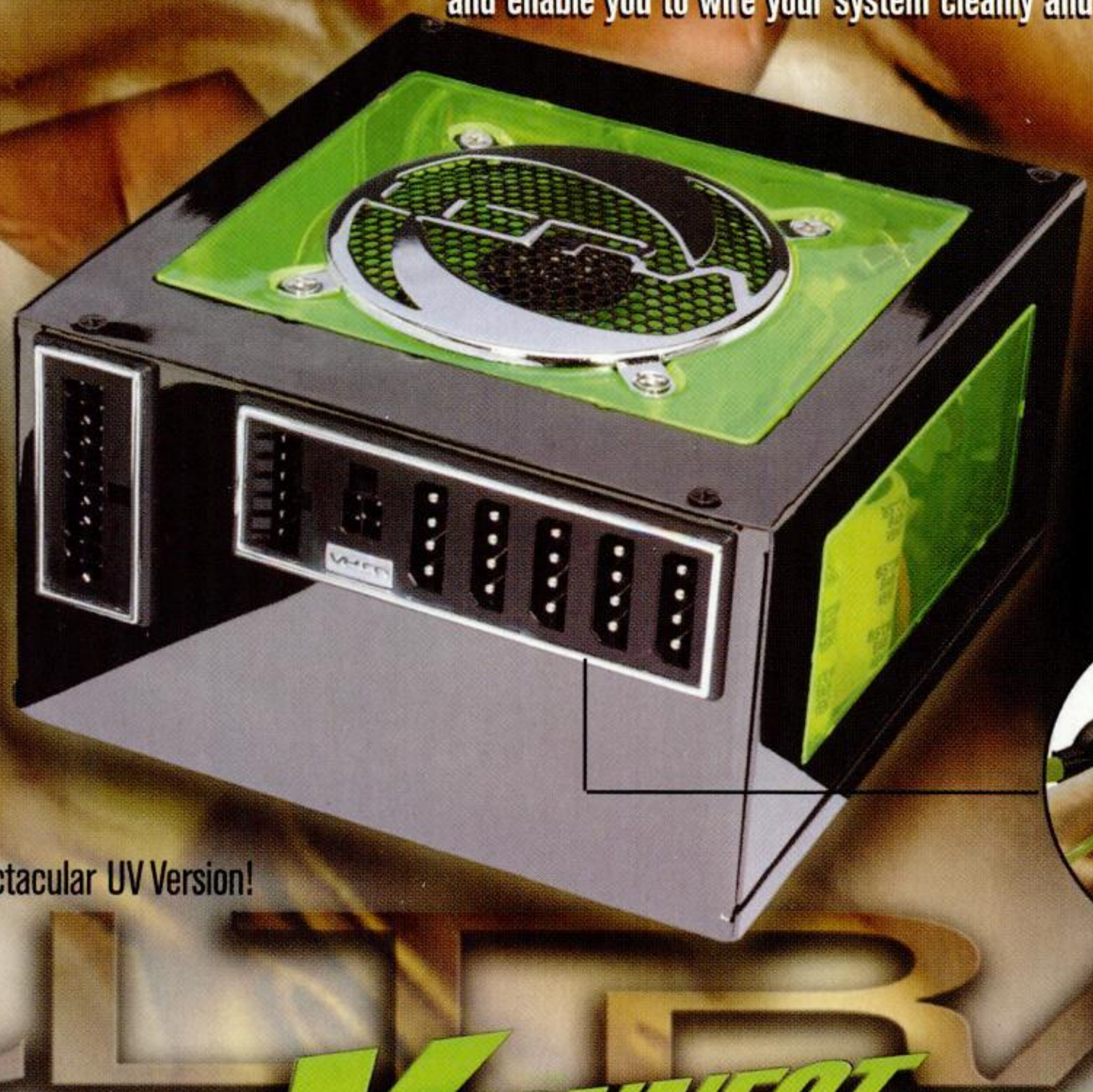

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